THE MARINE RECORD

ESTABLISHED 1878

VOL. XIX. NO. 27. CLEVELAND—JULY 2, 1896—CHICAGO. $2 PER YEAR. 10c. SINGLE COPY

OLD AND NEW STEAMER CITY OF BUFFALO.

Mr. Egbert P. Watson, the veteran editor of The Engineer, published in his paper some weeks since a few reminiscences about the old steamer City of Buffalo, which formerly plied between Buffalo and Cleveland, in reply to a fake story regarding the boat which was then going the rounds of the papers. THE RECORD reprinted Mr. Watson's remarks at that time. The following letter was then written to The Engineer in regard to the new C. & B. boat:

EDITORS ENGINEER: In view of the item in The Engineer, page 132, May 23, 1896, and of your great interest in steamers between Buffalo and Cleveland, we send you herewith memoranda of the new City of Buffalo, which has been on that route hardly two weeks. You will notice that the item referred to is inaccurate, in that it makes stroke of the low-pressure cylinder on the present City of Buffalo 10 feet instead of 12. The greatest number of revolutions, however, counted by us on the trial trip was 32 per minute. The first run from Buffalo to Cleveland was made in 9 hours and 2 minutes, the engine averaging 26.3 revolutions per minute for the entire time. This was easy work. Since then the boat has made runs in 8 hours 45 minutes and 8 hours 47 minutes without any especial effort.

The dimensions are as follows of the steamer City of Buffalo, 1896, built entirely (excepting engine) by Detroit Dry-Dock Co., Detroit, Mich., for Cleveland & Buffalo Transit Co.: Length on water line, 298 feet; length over all, 308 feet; breadth molded, 41 feet; depth molded, 17 feet; mean draught of water, light, 10 feet 2 inches; mean draught, loaded, 360 tons, 11 feet 6 inches; total freight capacity on deck, 350 tons. Six boilers, Scotch type, 12 feet 6 inches diameter by 12 feet long; steam pressure 125 pounds per square inch; Howden forced blast; compound beam engine, built by W. & A. Fletcher Co., Hoboken, N. J., high-pressure cylinder, 52 inches diameter by 8 feet stroke; low-pressure cylinder, 80 in. diameter by 12 feet stroke; feathering wheels, 28½ feet diameter outside of buckets by 12 feet face. Best time Buffalo, N. Y., to Cleveland, O., so far reported, 8 hours 45 minutes, 350 tons freight on board.

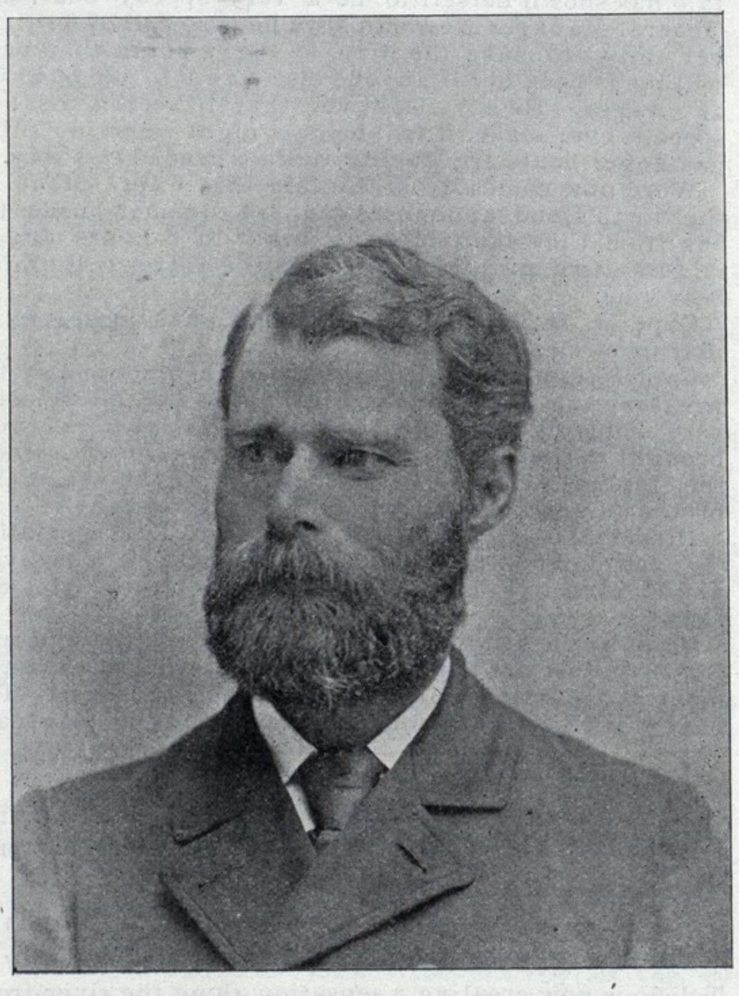
S. TAYLOR, V. P. & G. S.,
W. & A. FLETCHER CO.,
Hoboken, N. J.

This has brought forth from Mr. Watson the following additional remarks, which cannot but be of great interest on the lakes:

"We are under obligation to Mr. Taylor for his information. The stroke of the low-pressure cylinder was quoted from memory only. It is interesting in connection—with the name of this new steamer—to compare performances—cursorily—with the old vessel of the same name, built in 1859 or 1860, in Buffalo, N. Y., by Bidwell & Banta. This was a wooden hull very heavily built and so sharp forward that she drew 13½ feet at that point and only 9½ feet aft, and despite a lot of kentledge aft and the transference of the baggage crates and trimming boxes to the same place the conditions remained about the same. Notwithstanding these defects she was the fastest boat on the lakes, and one of the fastest long-distance boats that ever turned a wheel. We believe that the Mary Powell, of the Hudson River route is the only boat that ever equaled the City of Buffalo of 1859. The latter vessel had a beam engine 82-inch cylinder by 12 feet stroke; two all Sligo iron boilers—dimensions forgotten, forced draught, and carried 50 pounds of steam. The forced draught was of the closed stoke-hold type and consisted of three six-foot, common fan-blowers, driven by three common slide-valve engines 14x12 inches; the blowers made—as nearly as we can recall now—about 600 revolutions per minute. The best time between Buffalo and Toledo, O., (she never ran to Cleveland) was 13 hours 30 minutes dock to dock, but for the 12 miles from the light at the mouth of the Maumee River to the dock at Toledo, she ran at only half speed on account of shallow water. The distance from Buffalo to Long Point light (Point Abino) is, we believe, 65 miles, and this light was abeam three hours after leaving Buffalo. The boat left at 9 o'clock and at 12 m. the light was square abeam regularly. The wheels were very large, 36 feet and heavy and had buckets 11 feet long by 36 inches wide; the dip was nearly five feet and tied the engine up so that even with 50 pounds of steam she never made but 17½ revolutions per minute. The dimensions of the boat were not far from those of the present City of Buffalo, but she could carry but very little freight for reasons previously stated. We believe that we are the only living licensed officer of this famous old steamboat, and our license is hanging in this office to-day."

SPECIFICATIONS FOR NEW TORPEDO BOATS.

The Navy Department has prepared a draft of an advertisement inviting bids for the construction of the thirteen torpedo boats authorized by Congress. Three of these boats must have a speed of thirty knots an hour and the others are divided into two classes, one of 22½ knots and the second of 20 knots. The plans for the 30-



CAPT. CHARLES H. MOTLEY.

knot vessels are to be submitted by the bidders, while proposals for those of the other two classes may be submitted on plans prepared either by the department or the bidders. In its advertisement the department gives the following approximate dimensions for the 22½ and the 20 knot classes: Type No 1 (20 knots)—Length on load line, 105 feet; beam on load line 12½ feet; mean draft, 4½ feet; displacement (about), 68 tons; indicated horse-power (about) 850; armament, two single deck torpedo guns, one one-pounder rapid fire gun, two automobile torpedoes and 180 rounds of one-pounder ammunition. Type No. 2—Length on load line, 140 feet; beam on load line, 14½ feet; mean draft, 4¾ feet; displacement (about) 105 tons; indicated horse-power (about), 1,700. Penalties for failure to attain the required speed are prescribed.

The governing depth of water in Sturgeon Bay canal is 15 feet.

MARINE RECORD Life Savers' Series.

CAPT. CHARLES H. MOTLEY,

The keeper of the Cleveland Live-Saving Station, Capt. Charles H. Motley, has been in charge of this responsible post only about two years, but in that time he has established a reputation as one of the most active and progressive men in the service. He has effected some great improvements in the general arrangement and equipment of the station since he took hold, and will, in a year or two, have one of the best stations on the Great Lakes.

Capt. Motley is one of the ever-popular Ohio men, having started his earthly career at Norwalk. Early in life he began to sail on the lakes, and was for some fourteen years in the employ of S. H. Davis, well-known fish dealer of Detroit, and later with Averill & Co., Cleveland. He served several years at the Thunder Bay Island station, and also at Middie Island station, where he had ample chance to learn both the theory and practice of the United States Live-Saving Service. He had retired to private life, and was again engaged in fishing, when he received his appointment, in April, 1893, as keeper of the Cleveland Station, succeeding Capt. Lawrence Distel, who was compelled to resign because of ill health, the result of his terrible experience in the flood of May, 1893, when he lost several members of his crew, his own life being miraculously saved. Capt. Motley has made himself very popular with Cleveland people and the entire lake-faring fraternity by his obliging disposition, his ready and practical sympathy in time of sorrow, and his promptness and bravery when casualities occur which demand the presence of the crew. He is ambitious for the extension of the service in scope and efficiency, and never lets an opportunity to that slip by because it requires his own personal efforts. As a result he stands high in the confidence and esteem of his superior officers.

PT. PELEE—DETROIT RIVER—SOUTH CHICAGO.

New charts issued by the Hydrographic Office. Strictly up to date. Issue of June 26, 1896. Pointe Pelee, $1.50; Detroit River, $1; South Chicago, $1. For sale by MARINE RECORD Publishing Co., Western Reserve Building, Cleveland.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD by George F. Stone, Secretary Chicago Board of Trade, June 27, 1896:

CITIES WHERE STORED.	WHEAT. Bushels.	CORN Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Albany	.....	20,000	100,000	.....	.....
Baltimore	175,000	254,000	392,000	119,000	.....
Boston	591,000	216,000	107,000	.....	.....
Buffalo	969,000	349,000	173,000	131,000	181,000
" afloat	.....	.....	.....	.....	.....
Chicago	13,656,000	5,677,000	1,476,000	307,000	10,000
" afloat	.....	.....	.....	.....	.....
Cincinnati	5,000	2,000	20,000	1,000	.....
Detroit	63,000	12,000	8,000	.....	.....
" afloat	.....	.....	.....	.....	.....
Duluth and Superior	9,092,000	13,000	263,000	325,000	213,000
" " afloat	.....	.....	.....	.....	.....
Indianapolis	9,000	53,000	1,000	.....	.....
Kansas City	959,000	30,000	23,000	5,000	.....
Milwaukee	436,000	2,000	49,000	369,000	26,000
" afloat	.....	.....	.....	.....	.....
Minneapolis	16,609,000	11,000	326,000	85,000	43,000
Montreal	395,000	30,000	313,000	6,000	42,000
New York	2,504,000	416,000	1,539,000	52,000	4,000
" afloat	24,000	33,000	82,000	26,000	.....
Oswego	.....	6,000	.....	.....	57,000
Peoria	10,000	11,000	286,000	2,000	.....
Philadelphia	250,000	206,000	156,000	.....	.....
St. Louis	424,000	92,000	45,000	1,000	.....
" afloat	.....	90,000	.....	.....	.....
Toledo	235,000	41,000	20,000	65,000	.....
" afloat	.....	.....	.....	.....	.....
Toronto	181,000	1,000	74,000	.....	21,000
On Canal	552,000	266,000	1,225,000	113,000	50,000
On Lakes	721,000	845,000	1,991,000	40,000	82,000
On Mississippi	.....	84,000	47,000	.....	.....
Grand Total	47,860,000	8,760,000	8,716,000	1,647,000	729,000
Corresponding date 1895	44,561,000	9,060,000	7,018,000	146,000	134,000

NEWS AROUND THE LAKES.

CLEVELAND.

THE PORT WILL PRESENT A FINE APPEARANCE WHEN ALL MUNICIPAL AND FEDERAL APPROPRIATIONS SHALL HAVE BEEN EXPENDED—NEED FOR STATISTICAL ADVERTISING—IMPROVEMENTS, ACCOMPLISHED AND CONTEMPLATED.

CLEVELAND, July 2.

Now that the legality of the municipal bonds for harbor improvement has been established, no more time should be lost in getting to work. The completion of the Greater Cleveland harbor will give the port one of the handsomest entrances on the chain of lakes. The new west pier will be of concrete, 150 feet west of the present structure, and will be considerably shorter, so as to leave the entrance into the breakwater basin sufficiently wide, and to prevent the formation of shoals. This will prevent all comparison of the new concrete pier with the old wooden structure known as the east pier, until it shall be renewed in like manner. At the shore end of the new west pier, as soon as the title to the land can be established, there will be erected handsome and convenient residences for the light-keepers, with suitable outhouses for storing oils. A little distance farther out along the pier an enlarged crib and concrete foundation will serve for the erection of the new life-saving station, which will consist of a keeper's dwelling which shall look as well as those of the light-keepers and be just as convenient, besides a large boat-house and ample quarters for the crew. Thus the west pier will present a very business-like and ship-shape appearance, and when the breakwater is once put in safe condition the work of renovation will proceed on the east pier. One can see already in the mind's eye, how the port of Cleveland will look a year or two hence. The harbor entrance will be majestic in true proportion to the importance of the port, and by that time the dock fronts on the lake front will have multiplied till this city will show other ports around the lakes what is being done here.

In this connection, why does not the Chamber of Commerce present some adequate weekly statistics of what is received at and sent out from this port? Nearly every other city on the lakes does it, even to little Gladstone. These showings look very well in print, and even if the figures on some lines cannot be obtained within a few hundred tons, the figures would show the people around the lakes that this port does a little marine business outside of iron ore and coal. The immense lumber receipts of the port are hardly ever referred to, and Cleveland is allowed to drop out of sight and remain there when the details on the growth of lake commerce is being discussed. Cleveland is doing almost as much as any of the other ports to develop her commerce along new lines with a view to its permanent increase, and the Chamber of Commerce should see to it that she has a little credit for it.

One of the new lines referred to in the above paragraph is the business which has been worked up by the Big Four Railroad Co., the Cleveland Commercial Co., the Cleveland & Buffalo Transit Co., and the Cleveland Steel Canalboat Co. This is the carriage to this port by rail of immense quantities of glucose and grape sugar from Peoria, the heart of the corn district, and its transhipment to the seaboard by means of the two water lines mentioned. The C. & B. boats are now taking about 300 tons per day of this stuff, and this, in itself, is a very convenient addition to the commerce of the port. The glucose is put up in barrels, about 700 pounds to the barrel, and its ease of handling and convenience for stowing make it one of the handiest water freights ever invented. The grape sugar, so called because it is made out of corn, is much in the form of maple sugar, and is carried in bags, making an excellent complement for the glucose, in a stevedore's eyes. The warehouse of the newly leased Otis elevator is already in active service in this trade, besides which lots of business is left for the new freight house at the old Big Four dock.

Cleveland's growth as a passenger port during the last five years is something wonderful. In 1891 the Detroit boats, with the Put-in-Bay boat in midsummer, and the occasional calls of the Lake Superior liners and the Grummond boats, constituted the only passenger service Cleveland enjoyed. Now all is changed. The Detroit boats have kept up and increased their traffic. A fine side-wheel steamer leaves every evening for Buffalo, and another for Toledo. Daily service is furnished between Cleveland and Ashtabula by the handsome and fast little steamer Skater, and the equally attractive Riverside makes round trips daily between Cleveland and Lorain, where close connection is made, via electric line, to Elyria. The daily service to Put-in-Bay is extended to include connections for Detroit, Toledo, Sandusky and Lakeside. Service of the most elegant and speedy character is afforded between Cleveland and the head and foot of the lakes by the calls four times per week, of the magnificent steamships North West and North Land, whose fuel bills alone—their coal is purchased in Cleveland—amount to more than is consumed annually by many large factories combined. The swift steamer Arrow brings a boat full of people once or twice each week from Sandusky, and the two fine ferry boats of the Euclid Beach Park Line keep the river hot with their hourly arrivals and departures. The fact that the entrance and departure of most of these boats are more or less delayed every trip by the close engineering necessary to get in and out without injuring themselves or other people is a sufficient argument for proceeding with all haste to widen the river.

In order to get the full benefit of its dock, the Detroit & Cleveland Steam Navigation Co., has purchased the Monroe property, with 58 feet frontage on both River street and the river, just north of St. Clair street, to which the D. & C. docks extend on the south side. The place was purchased from Mrs. C. White, the purchase price being $15,500. The brick building on the property was re-leased to its present occupant as the dock was all that the company wanted. The wharf now extends ten feet beyond the city dock line, making so sharp a curve that the D. & C. boats could not lie close enough to their own dock. Now this ten feet will be removed, and the dock line made to conform with the city surveys. This purchase gives the company the full benefit of the city's dock at the foot of St. Clair street, some 80 feet in width, and also of about 40 feet of lock room in front of the Floating Bethel Society's property, which adjoins the new purchase on the north. Thus the D. & C. Company has nearly 800 feet continuous dock frontage, or by all odds the finest wharf property in Cleveland.

Cleveland people have been all agog during the week owing to reports and denials of a race between the C. & B. Liner City of Buffalo, and the twin screw steamer North West. The two steamers left Buffalo at the same time last Friday evening, and the City of Buffalo arrived in Cleveland first. The side-wheeler reached her dock some time ahead of the North West, but the latter remained outside on account of thick weather for some little time, making it impossible to draw conclusions as to how the trip resulted. Managing officials of both lines deny that there was any racing done, and the City of Buffalo has a record of eight hours and 45 minutes, which is six minutes better than she did Friday night, while Manager Farrington of the Northern Steamship Co., states that the North West was running only on schedule time, with ironclad instructions to her master not to exceed it. The North West certainly took a course in heading for Cleveland that put her far in toward shore, which would put her in water so shallow that high speed would be prevented. The City of Buffalo has shown herself to be a very speedy boat, and General Manager Newman says he is so full of faith in her ability to make the trip in eight hours that he is willing to back her if anyone else wants to put up $1,000 as a wager. He says, however, that if such a trial of speed is ever made, it will be on a night when no other passenger boats are leaving Buffalo headed this way.

Word now comes from Buffalo that Capt. Stone, of the North Land, announces that his steamer made the run from Cleveland Monday night in 8 hours and 45 minutes, two minutes better than the City of Buffalo's best time.

Capt. J. S. Dunham, of Chicago, was mingling in marine circles Wednesday.

Capt Joseph Bowen, who has been in command of the wrecking tug C. E. Benham at Sault Ste. Marie, died very suddenly there last Friday. His remains were brought to Cleveland, and then sent to Lorain, where the funeral services were held at the home of his brother, Capt. James Bowen, of the tug Cascade.

President L. C. Hanna ,of the Mutual Transportation Co., accompanied by Messrs. H. C. Frick, H. W. Oliver, and H. M. Curry, is on a trip to Duluth on the steamer Corsica.

Capt. Samuel Butman, of Lorain, has sold the schooner Smith & Post to Capt. Joseph Doville, who has parties from Saginaw associated with him in her purchase. The boat will be given a thorough overhauling at Saginaw.

DETROIT.

CONSIDERABLE CONTROVERSY OVER THE COMPARATIVE SPEED OF RIVER BOATS—A LARGE STAKE DEPOSITED.

Special Correspondence to The Marine Record.

DETROIT, July 1.

The lately purchased and improved steamer City of Toledo is now creating a sensation along the river front by the time she is making in running from Detroit to Port Huron and back. For years the Kirby has held the records up and down, they being as follows: Detroit to Port Huron, making 13 landings, including Algonac, in 4 hours and 50 minutes; return trip, same number of landings, 4 hours and 17 minutes. On Sunday last the City of Toledo made the run up, stopping at 14 places, in 4 hours and 42 minutes, and the run down, calling at 13 places, in 3 hours and 55 minutes. A short time since she did even better than this, making the run up in 4 hours and 52 minutes, making 20 stops.

The yacht Bonita beat the City of Toledo a half mile in an hour in a race last week, and Mark Hopkins, her owner, has placed $1,000 with a friend, betting that either his yacht or the steamer Unique can run faster than the City of Toledo. There are several boats at this port whose time is so nearly even that a slight advantage in wind or current is likely to give them the victory.

The D. B. I. & W. ferry steamers are now running to Fighting Island, which, under its new and improved management, is destined to become one of the most popular resorts around Detroit. A determined attempt has been made to make it a favorite with the better class of people, and to do away with the objectionable features of the resort under its old regime. President Campbell, of the ferry company, is much pleased with the new conduct of affairs, and is taking an active interest in promoting the success of the place.

Detroit ore-vessel owners are naturally rather blue over the steady depreciation in freight, and the old, old question of combining for mutual protection and advantage naturally crops up now and then.

Captain Ruelle's tug Lorman was a little longer in repairing than the captain expected. She is now out in as good condition as ever.

The D. B. I. & W. Ferry Co. has undertaken to run the route between the city and Fighting Island. The service is excellent, and for this season at least will probably now do away with the hotel people running a boat of their own. The yacht Roberta was altogether inadequate, as 1,500 people went down last Sunday.

The steamer Unique, after being a week at the Frontier Engine Works for repairs, is again out.

The steamer Brazil was grounded and sank Wednesday morning opposite Amherstburg under peculiar circumstances. The Marina, going down fast, passed the Brazil, which was close to the docks, at such a speed as to draw the water away from her to such an extent as to allow her to settle on the bottom under speed, and so puncture her enough to sink her. The wrecker Saginaw released her at noon after lightering part of her cargo, and she proceeded to Detroit. She will make temporary repairs here.

McC.

BUFFALO.

COAL SHIPMENTS SEEM SMALLER THAN THEY REALLY ARE—TUG INTERNATIONAL ALL RIGHT—LAKE COMMERCIAL PROSPECTS.

Special Correspondence to The Marine Record.

BUFFALO, June 30.

There is no change here in the midsummer business on the lakes, but the slowing up of the coal shipments. This is for the most part apparent rather than real, for there went out of this port over 86,000 tons of coal by lake last week. There is, however, a prospect of less this week, for the shippers have no coal on hand and say that they do not look for much at present. Otherwise the business is holding up well. Canal men are saying that they are probably past the slowest part of the season and they look for more business in the future, though for that matter they have had enough to do all the season.

It is to be hoped that the ambitious Cleveland canal men will do what they can to show us how to get hold of something to carry east except grain, lumber and pig iron. The canal has had considerable glucose to handle, but for the most part they do not like it any too well. It is sticky stuff and runs through the barrels too much for comfort, especially when something else is to be carried after it.

Some queer things came out in connection with the Friday night trip of the City of Buffalo and the North West from Buffalo to Cleveland. Most of the people here were foolish enough to suppose that they were racing, especially as there was an accepted challenge between the two lines and from the dispatches sent out from Cleveland it appears that some one there had the same idea. Of course Detroit would be sure to make the most of a boat that was built there, but when both Manager Farrington and Manager Newman hold up their hands together, or separately, in horror at the idea, we all give in. It is certain now that both boats would have taken the overland route rather than have any one suppose for a moment that such a thing as a race was thought of.

One really interesting thing did happen in connection with the trip of the two boats, in spite of the disclaimers that have been sent out. When the steamers left here there were a great many other boats, large and small, loafing about and the swell they left behind them made it lively for the little fry. Many a skiff stood fairly on its head, if it can be said to have a head, and the little police patrol steamer caught it with the rest. When the big liners were away the captain of the police boat reported that his craft turned completely over and came up safe and sound. That captain should be sent out at once to report on the sea serpent before the season is too far gone.

I was glad to come across Capt. Henrichs, of the steamer Waverly, this morning, ready to take charge of his boat again. He was the victim on the 10th of June of an accident that came near costing him his life. The Waverly was taking ore at Ashland and through some one's carelessness he was struck on the head with an iron bar, which knocked him senseless. Then the doctor in charge dressed the wound and left a clot of blood on the brain that had to be removed before recovery was possible. The Waverly has gone into the iron ore trade to Tonawanda, towing the barge L. W. Drake.

Somebody took occasion to send to one of the city papers last week a letter criticising the captain of the International bridge tug because the steamer Simon Langell got on the pier of the bridge on her last trip down the Niagara. This stirred up the ire of Capt. George McLeod, who had charge of the work of releasing the boat, and he wrote a reply that settled all question as to the matter. The tug International is one of the most efficient in the service, and has a record that

could not well be surpassed, for no barges ever get into serious trouble when in her territory, and this is saying a great deal, for the bridge is built at the foot of a bad rapid in the river. It is not common to go to the assistance of steamers till called.

Detroit has sent us the schooner Doud with wheat this week, just as a matter of good faith, I suppose, for it is about the second cargo that has come in from there this season. Toledo is doing very little better, and the line boats that are run between there and Buffalo are having hard sledding, according to all appearance, to get cargoes. If these slow times for the side ports keep up, and especially if Chicago absorbs the western and southwestern grain right along, there will be need of a passenger appendix or something of the sort to piece out the Toledo trade. Detroit now neither sends us grain nor takes our coal.

There is prospect of a new lake line to Buffalo before the next month is out. It comes by way of the Wisconsin Central Railway which takes the water at Manitowoc, where it is preparing to build extensive terminal facilities. The Vulcan fleet—Brown, McGregor, Forest City, and Hackett—is mentioned as the water link of the through line, but it is pretty sure to develop that Buffalo people are in the scheme too, though that is a secret as yet. The old lines have always said that another line was pretty nearly an impossibility, but they may have been engaged in giving expression to to their wishes. Time will have to tell as to that.

The sailing in the lake line combination is not the smoothest these days, and it is not made much of a secret that if it were not for the Joint Traffic Association the whole thing wou'd go to pieces. One day the Western Line takes all the grain at a figure others refuse, and another day the Lackawanna Line takes all the flour in a way that suggests a secret cut.

The report of a dicker with some New York capitalists for the sale of the Ziegler excursion boats has gone no further, and it looks as though it had fallen through. The excursion interests are languishing more or less, the falling off being laid to bicycles. Buffalo has a good fleet and they deserve to do well.

JOHN CHAMBERLIN.

CHICAGO.

BOUND TO HAVE A FIRST-CLASS HARBOR—CRUSADE AGAINST THE TUNNELS—DEATH OF A VETERAN LAKE STEWARD.

Special Correspondence to The Marine Record.

OFFICE OF THE MARINE RECORD,
CHICAGO, July 1.

An important conference was held last Thursday at the Mayor's office between Mayor Swift, President Eckhart, of the drainage board, U. S. Engineer Marshall, and Capt. J. S. Dunham, representing the Chicago River Improvement Association. While only about $360,000 is required by the engineers' estimates, through an error in the wording of the clause of the river and harbor bill the entire amount authorized, $750,000, must be used for dredging, although this sum was intended to include straightening the bends in the south branch. This matter will probably be adjusted by Congress at its next session.

Major Marshall said he would advertise in a few weeks for bids on dredging, and that he would expend $50,000 during the summer. The dredges will begin at Lake street bridge and work south. Then the north branch will be deepened, and the main river dredged, all to a depth of 17 feet. It will take two years to do the work.

Capt. Dunham said that was very good as far as it went, but wanted the river dredged from 22 to 24 feet, and said the time had come when steps must be taken to lower the LaSalle, Van Buren and Washington street tunnels. Mayor Swift pointed out that the city should not compel the street railway company to lower the Van Buren street tunnel. The city owned the other two, and lowering them was merely a matter of expense. Major Marshall said that the Secretary of War could compel the lowering of all the tunnels, as the U. S. Government was in charge of this river, but that he should hesitate a long time before he would recommend any summary action on this line. Capt. Dunham said the improvement association expected to take the matter up with the Secretary of War very soon.

Mr. Eckhart said his board would have the canal finished and be ready to connect it with the Chicago River by the fall of 1897. This board expects to widen the river between Van Buren and Eighteenth street in several places. The channel there would be deepened to 24 feet, in order to get a proper volume of water into the canal. The current which this canal would make in Chicago River would not, he said, exceed 1¼ miles per hour. The entire expense of constructing the canal, widening and deepening the river in the locality mentioned, and making the connection complete would be $29,000,000.

William F. Plumsteel, aged 54, steward on the steamer City of Milwaukee died of apoplexy last Friday morning at Benton Harbor. He was stricken with an apopletic fit on Thursday between 1 and 2 p. m. when on board the City of Milwaukee going to St. Joseph from Chicago, and was just before the attack attending to his duties and apparently in good health. The deceased had spent many years as a steward on the lakes and was much respected and liked. Prior to his entering the service of the Graham & Morton Transportation Co. two years ago, he had been in the employ of the Northern Michigan Transportation Co. fifteen years, before which he was for several years with the Northern Transit Co., running between Chicago and Ogdensburg, and was on board the steamer Brooklyn when she blew up on Detroit River. His remains were sent from Chicago to Ogdensburg on Sunday last.

The Dunham Towing and Wrecking Co.'s new tug Spencer will go into commission this week. She has received a new fire-box boiler 12 feet long by 7 feet 1 inch in diameter, and allowed 175 pounds steam pressure to the square inch, and supplied with two Yugada furnaces or stokers. It is claimed the Spencer's new boiler is allowed more steam pressure than any other fire-box marine boiler on the lakes. Capt. James Sinclair, superintendent of the D. T. & W. Co. is now using one of Hall's megaphones on the balcony outside of the company's office to give orders to their tugmen going up and down the river and at their dock on the opposite side of the river. It is claimed that the instrument will carry and receive the voice to and from the distance of one or two miles.

The sidewheel passenger steamer Chief Justice Waite has received a thorough overhauling and is again engaged in the excursion business. Capt. Ira H. Mansfield is in command, and the steamer is doing good business carrying excursionists between the lake front and Windsor Park, and moonlight excursions from Clark street bridge out into Lake Michigan.

J. A. Calbick & Co. chartered the steamer W. P. Ketchum for oats and her consort Geo. B. Owen for corn to Buffalo; the steamer Adella Shores for wheat at 2¾c, and consort Middlesex for corn at 2¾c, both to Kingston.

Carr & Blair chartered the steamer George T. Hope for oats to Buffalo at 1⅛c; her consort J. C. Fitzpatrick for corn to Buffalo at 1¼c; the steamer Lindsay for oats to Buffalo and Black Rock at 1⅛c and 1¼c; the steamer Progress for clipped oats to Sarnia at 1⅛c.

J. J. Rardon & Co. chartered the steamer Phoenix for oats to Buffalo at 1c; the steamer City of London for corn to Buffalo at 1⅛c: schooner Commerce for oats to Sarnia at 1⅛c.

Capt. John Prindiville chartered the steamer Philip Minch for corn at 1¼c and oats at 1c to Buffalo; the schooner P. B. Locke for corn to Port Huron at 1⅛c.

H. W. Cook & Co. chartered the steamer W. H. Wolf for corn to Buffalo at 1¼c; the schooner George Boyce for oats to Port Huron at 1⅛c.

THOMAS WILLIAMS.

FLOTSAM AND JETSAM.

Marquette ore shipments for last week were 79,250 tons.

Whaleback barge 102 has been given the name of Sir James Whitford.

The name of the steamer Washburn has been changed to James R. Nelson.

The best stage of water for three years is reported from Saginaw River.

The Parks Foster lately discharged 200 tons of ore at Conneaut in 7½ hours

Bay City 'longshoremen have struck for an increase from 40c to 50c per hour for loading vessels.

The Manistique has towed 4,028,717 feet of logs from Spanish River to Bay City, the largest raft of the season.

The Columbus, Sandusky & Hocking has contracts for lake coal which will give the road 35,000 tons in June and a like amount in July.

Capt. A. J. Fox, of the steamer F. E. Kirby, is in the hospital, very critically ill. Mate B. F. Williams is in command of the vessel for the present.

James Balibur, engineer of the Merida, who was injured by falling into the hold of the steamer at the time she went through herself, is about rid of his injuries.

The Norrie, East Norrie and Pabst mines resumed operations Monday, June 2, with nearly full forces. The Metropolitan group is now working nearly 1,000 men.

The big schooner Aurania is still mistress of the unsalted sea, so far as big cargoes from the head of the lake is concerned. She took out 3,900 gross tons of ore from the Mesaba dock last Thursday.

The steamer John B. Trevor passed the Sault locks at 7 o'clock Monday evening of last week, and passed Detour at 12:30 Tuesday morning, making the night run through the St. Mary's River, with two barges in tow, in 5½ hours.

The net earnings of the steamer St. Paul from May 21 to June 17 were $1,404, according to a report made to the probate court of Wayne county, Mich., by B. W. Parker, administrator of the late Capt. Bernard Wild's estate.

The Wisconsin Central is about to erect a 500,000 bushel elevator at Manitowoc, to be completed within six months, and to be ready for the opening of navigation next season. A steamship line to operate between Manitowoc and Buffalo will then be organized.

Capt. Adolph Freitsch announces that he will start from Milwaukee this month on his tour around the world in his new yacht, the Schlitz Globe, which is only 34 feet long over all. The boat was built by Captain Freitsch himself, at a cost of about $1,000. He will go alone in her.

The U. S. S. Michigan is at work surveying the region in the vicinity of the Islands of Lake Erie, and has erected stations for triangulation purposes. The huge boulders on which the John Oades, J. S. Fay, American Eagle and other vessels have struck will be located and buoyed.

At the annual meeting of the Sault Ste. Marie Ferry Co., held last Friday, the directors were chosen as follows: Frank Perry, president; George Kemp, vice-president; Robt. D. Perry, secretary and treasurer; Capt. Chas. Ripley, and W. H. Plummer. Capt. Ripley was made general manager.

It is stated that the shipment of iron ore from Duluth and Winnipeg dock at Allouez Bay, Superior, are to be more than doubled from this time on. Extra crews will be set at work, and the dock will be operated night and day. Most of the ore shipped from this dock will be from the Missabe mine.

The board of public works of Racine, who have had men at work repairing the protections to the several bridges spanning the river, has been ordered to stop the work by United States officers, who claim that the abutments as repaired will encroach from two to five feet upon the channel of the river.

The Hamilton, Ont., Iron and Steel Co. has begun to receive ore from the Lake Superior region through the United States. The steamer H. B. Tuttle discharged at Conneaut 1,000 tons of Red Lake ore from Two Harbors, which was loaded into cars and shipped to Hamilton via the Shenango ferry line.

Wheat in store at the head of the lakes last Saturday was apportioned among the varions terminal elevator lines as follows: Belt Line, 1,119,690 bushels; Consolidated 2,070,755; Globe, 3,278,619; Great Northern 961,647; Superior Terminal, 1,495,515; Consoldated B, 118,751; Consolidated H, 44,783; total, 9,091,769; in store at Minneapolis, 16,607,266, a decrease of 160,828 bushels.

A despatch from Ottawa states that the Canadian lock has made the largest single lockage ever known there. Five boats, with a total length of 1,191 feet, and a tonnage of 4,918 were passed through at once. They were the City of Grand Rapids, 135 feet long; steamer Spokane, 311 feet; steamer Iron King, 265 feet; schooner Iron Queen, 275 feet, and tug F. H. Stewart, 65 feet.

Carkin, Stickney & Cram have been awarded the contract for dredging the Portage River, from a point below Port Clinton to Oak Harbor to a depth sufficient to allow vessels of ordinary depth to go up the river to the latter place. The work will be done under the sppervision of the commissioners of Ottawa county, and is to be completed at an early date. As soon as the river is navigable the steamer Maud Preston, now on the Port Clinton and island route, will extend her trips to Oak Harbor.

There was a delay of 19 hours at the Sault canal Sunday night and Monday morning of last week. The delay was caused by the breaking of the grating which covers the valves and one of the pressure pipes was also broken. The damage was caused by the center-board of the schooner Paige, which went through the canal shortly after 4 o'clock Sunday afternoon. The center-board, which should have been raised, was down its full depth. The lock was closed at 5 o'clock Sunday night, pumped dry, and the repairs were not completed until Monday at 11:30 o'clock. Locking was resumed at noon. The Canadian lock did a heavy business in the interim.

A combination freight car, used on the Duluth, South Shore & Atlantic Railway, can be used as a hopper-bottom ore car during the shipping season, and then converted into a flat or gondola car for lumber traffic during the winter. When used as an ore car the end slopes of the hopper extend up through the body of the car to the top of the sides, but these sloping ends can be folded down over the hopper to form a flat bottom from end to end of the car. The car will carry about 27 to 30 tons of soft ore and 30 to 33 tons of hard ore. The results have been so satisfactory that 600 cars of this type are now being built.

The building of a dry-dock at Portage Lake is being agitated by vesselmen and an attempt will be made to convince capitalists of the profitable nature of such an undertaking. It would be far better for the maritime of the lakes if steps were taken for the location of a dry-dock at the Soo. One is badly needed here, and would prove a veritable gold mine to its owners. More vessels pass here than at any other one point on the chain of Great Lakes. Boats meeting with serious mishaps near the Soo have to be taken to Bay City or Detroit to be repaired, when the work could be done to a much greater advantage here were there facilities. It would save the vessel men time and money.—Sault Ste. Marie News.

GOOD WORK OF LIFE SAVERS.

ALPENA, June 30.

Special Correspondence to The Marine Record.

The lake tug John Owen, of Alpena, when on a recent trip had one of her crew, Harry Dam, taken seriously ill when off Hammond's Bay. The tug had hold of a raft which it would not be safe to leave, so Capt. Lillis signaled to the Hammond's Bay life savers. Capt. Valentine and his crew came promptly to the tug, took off the sick man, and took him to Rogers City, making the trip of over 20 miles in less than three hours. At Rogers City medical assistance was procured, saving the man,s life.

Capt. Lillis, of the Owen, wishes to thus publicly thank Capt. Valentine and his men for their prompt assistance, and to commend them as one of the ablest crews in the life saving service.

H C. H.

C., H. & D. ELEVATOR "B" AT TOLEDO.

The new C., H. & D. R. R. elevator recently completed at Toledo, with its engine and boiler house, stack and coal shed adjacent thereto, together with foundations for all, and all the machinery and millwright work contained therein necessary to place the entire structure in complete and satisfactory operating condition, is doubtless one of the most substantial and complete plants of the kind erected in this country, says the American Elevator.

The elevator is a plank and frame structure with a brick engine and boiler room and stack. The main building is 90x264 feet, and has 165 storage bins 65 feet in depth, with an aggregate net capacity of 1,000,000 bushels. The engine and boiler house, 38 feet 6 inches by 68 feet 6 inches, is divided into engine and boiler room with a brick partition between. The stack is 12 feet 6 inches square at the base, and 159 feet 6 inches high, this being one foot above the highest point of the main building.

The grain business transacted in and through the elevator is to unload and load cars, also to load and unload boats. Arrangements have been made and appliances been provided for cleaning and caring for grain in the most approved manner. The elevator contains 12 elevator legs, of which six are receiving elevators designed for unloading cars and six shipping elevators for loading. Each of these legs is capable of elevating at least 8,000 bushels of grain per hour.

Each elevator leg is equipped with drop signals between the first floor and the weighing floor in the cupola; these signals are of approved construction and designed to give the very best service.

There is also a dock elevator constructed and inclosed in a tower in the south end of building on the river side, which is capable of elevating from boats at the rate of 8,000 bushels per hour.

Located in the scale floor story of the cupola are 12 hopper scales of 1,200 bushels' capacity each. Immediately over each scale in garner floor is a garner having a capacity of 1,500 bushels for receiving grain while scale hoppers are being emptied. The garners have an 18-inch opening at the bottom, through which 1,200 bushels of grain can be dropped into the scale hoppers in two minutes, thus allowing the elevators to carry up grain continuously without any interruption on account of weighing.

All fixed spouts are manufactured of No. 1 white pine and lined with No. 16 black iron across the bottom of each spout, and four inches up each side. The revolvers under the scale hoppers are carried on independent timbers, having no connection between these spouts and the hoppers. The spouting between the scale hoppers and the bin story is made of iron on what is known as "trolley spout system," the diameter of the upper section being 12 inches, and the lower section large enough to telescope freely over the upper. The lower end of the outside sleeve is carried on suitable cast-iron truck, carried on swivel castor wheels. The movement of this truck is perfectly free in all directions and capable of being handled easily by one man; each spout is made to connect with every bin within its greatest diameter of movement, circular openings having been cut through the floor as near the center of each bin as is practicable and each opening covered with a trap door, laid in flush with top of floor. From each scale are built direct shipping spouts of wood to the shipping bins; these direct spouts connect to revolver under scales and deliver to the shipping bins through the shortest possible distance.

The lower floor spouting from the bottom of bins is an innovation in elevator spouting, being arranged with an intermediate revolver, having spout connection with several bins, thus making it convenient to run grain from the several bins to the elevators by simply putting up a short portable spout, and avoiding the trouble and expense incident to hanging up long portable spouts to every bin.

For the purpose of loading grain into cars automatic car loaders have been provided of the most approved pattern, which are capable of loading 1,200 bushels of grain without trimming. Located under the shipping bins on the dock side are 12 shipping spouts for loading boats. These spouts are hung from large cast-iron revolvers, built in and secured to the crib work under the shipping bins; each spout is constructed with 12-inch well tube in one piece, having a 13-inch well tube in one piece sliding on the outside, and each is handled by means of a special hoisting apparatus by which the spout may be controlled and placed in position on the ship at the dock. In the cleaning room provided in the northeast corner of the building, with bins above and below, are four elevator separators of an approved pattern and make, with a maximum capacity of 2,500 bushels per hour each, provided with spouts and driving connections complete.

The engine for the main power plant is a Hamilton-Corliss, direct-acting, condensing type, developing 50 horse-power at 60 revolutions, with mean effective pressure of 40 pounds to the square inch. The valve mechanism and general arrangement of the engine is complete in every detail, having a main shaft extending into the elevator building. The weight sufficient for the flywheel of this engine is incorporated in the main driving sheave, which is 16 feet in diameter, having 16 grooves turned in its face, designed for rope transmission. Three first-class standard make of return tubular boilers, 66 inches in diameter and 16 feet long, having tubes four inches in diameter, generate the steam necessary to run the entire plant.

Fire protection is afforded by a duplex fire pump of standard make, 20x10x16 inches, with a complete system of standpipes, hose reels and hose connections distributed over the building. These hose valves are so distributed that every part of the interior of the building may be thoroughly drenched by one or more plugs, using a 50-foot section of hose. Water can be had both from the river, with which fire pump is connected, and the city main, which has a connection with standpipes in elevator. Two dozen fire extinguishers are distributed about the building in suitable locations for immediate use.

THE C. H. & D. R. R. ELEVATOR "B" AT TOLEDO.

The electric plant is driven by a separate automatic high-speed engine of approved make, located on a foundation provided in the engine room. This engine is connected by means of a rawhide rope drive direct to a dynamo of 25016-candle incandescent light capacity, 110 volts. Distributed over the building are 261 incandescent lights. On the outside are six arc lights, four of which are located on dock side, and one at each end of building.

All main transmissions of power to the different parts of the elevator are made of manilla rope transmission. A passenger elevator with plain finished car about 6x5 feet is located in vacant bin space in south end of the building. This passenger elevator runs between the first floor of the elevator and the top floor of the cupola at a speed of 75 feet per minute, and has an easy working capacity of 1,000 pounds. It is provided with all necessary safety attachments, counter weights, heavy wire screen over car, and swing gates at each floor in cupola.

This elevator was built on exceptionally carefully planned foundations, which were put in under very adverse circumstances, the Maumee River inundating the foundations and breaking the dams erected around the same repeatedly during the construction. The contractors went to great trouble in securing the best and largest piling in the market, and that at a time when the oil excitement occupied the time and attention of nearly all the pile furnishers and the teamsters in the surrounding counties where the piling had been contracted for. Nevertheless the elevator was erected on top of its foundations in less than four months, barring some of the corrugated iron covering, which was finished shortly afterward. The contractors for the elevator, wharf and dock were The Heidenreich Co., elevator builders, Rookery Building, Chicago.

LAKE HOSPITAL CONTRACTS.

Surgeon-General Wyman, of the Marine Hospital Service, has made the following contracts for the care of seamen. etc., during the coming fiscal year:

Buffalo—The medical attendance to be furnished by a medical officer of the Marine Hospital Service; Buffalo Hospital (Sisters of Charity) to furnish quarters, subsistence, nursing and medicines, at 80 cents a day; contagious at $2 a day, and to provide for the burial of deceased patients at $10 each.

Oswego—The medical attendance to be furnished by an acting assistant surgeon; Oswego Hospital to furnish quarters, subsistence, nursing and medicines at $1 a day.

Erie—The medical attendance to be furnished by an acting assistant surgeon; Harmot Hospital Association to furnish quarters, subsistence, nursing and medicines at 71 cents a day; care and treatment of cases of contagious diseases to be furnished by the health department of the city of Erie at $2.85 a day.

Ashtabula—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Henry Whelpley to furnish quarters, subsistence and nursing at $1 a day; contagious diseases, $1.50 a day; John Ducro & Sons to provide for the burial of deceased patients at $14 each.

Cleveland—Hospital patients to be cared for in the United States Marine Hospital; Hogan & Sharer to furnish ambulance service at $2 for each patient and to provide for burial of deceased patients at $16 each.

Detroit—Hospital patients to be cared for in the United States Marine Hospital; out patients to be treated at the dispensary, No. 90 Griswold street; Edward H. Patterson to provide for the burial of deceased patients at $10 each.

NOTES.

Proposals are asked for on the construction of a new fog signal house and keeper's dwelling to be erected at North Manitou light station.

Margarita II, the new yacht designed by George L. Watson for A. J. Drexel, of Philadelphia, was launched at Troon, Scotland, on June 14, being christened by Mrs. Watson, mother of the designer.

Secretary Herbert last week issued advertisements calling for bids on the construction of the three battleships of about 11,000 tons displacements. The bids are to be opened on Sept. 14, four days before the opening of the bids on the proposed torpedo boats. The advertisement will call for bids on vessels superior to the Indiana class, and much better than the Kentucky and Kearsarge. Their superiority over the latter will lie, it is claimed, in the arrangement of their batteries.

Engineer-in-chief J. W. Collins is on an inspection trip to Cleveland, Boston and Philadelphia, at which places he will examine the work on the new revenue cutters. Rapid progress is being made with the construction of the new revenue cutter Golden Gate, by the Moran Bros., of Seattle, Wash. Work will soon begin on the preparation of the plans for the new lake cutters recently authorized by Congress. They will probably be very nearly duplicates of Revenue Cutter No. 1, building at Cleveland.

SMALL BARGE PROPULSION.

The question of small barge propulsion is becoming of greater interest in these days of the renaissance of canal commerce, and while the problem will be largely solved should the trolley electric system be supplied, there will still be considerable towing expense involved through rivers and harbors which form the canal terminals, as at Buffalo, Oswego, New York, and, in a small way, Cleveland. The trolley system is good as far as it goes, but a system which can be contained entirely on the boat itself, and yet not prove so expensive as steam in first cost or operation, is certain to prove the power that will be most popular. If the Cleveland-New York canal barge route should prove so attractive as to induce other owners of canal craft to enter into competition with the inaugurators of this enterprise, the use of such a power would give competitors a tremendous advantage, even under the new rule requiring men to have suitable licenses for operating any kind of oil or other engine.

Electric propulsion by means of storage battery may sometime prove to be the desirable thing in this direction; but this system has not yet been simplified sufficiently, nor have the obstacles to its regular commercial use been sufficiently overcome to cause transportation companies to place reliance in it.

The question has been seriously considered in Great Britain, where there is a great deal of the barge traffic on the canals, and sluggish rivers; and prominent engineering works have introduced several types of oil engine, adapted for marine purposes, which, it is claimed, fulfill completely all requirements of cheapness, economy in operation, safety, and reasonable speed. One of these is the Thistle engine, which Bow, McLachlan & Co., of Paisley, Scotland, have begun to manufacture after several years experimenting with oil, as a result of their wonderful success with gas engines for stationary purposes. These oil motors are very simple, reliable and efficient, the cost of working in Great Britain being about one-half penny per horse power per hour. This would be considerably less in this country, especially in the lake and canal region, which are so near the sources of supply of petroleum, as the ordinary oils of commerce are used. No gasoline, benzine or benzoline, or any light spirituous oils which are dangerous are used or required to operate the Thistle engine, and no ignition tube or vaporizer has to be kept hot by a lamp or external flame; consequently, all the oil consumed after starting is used to develop power, and unlike steam or gas engines, there is no risk of explosion. All of the usual laborious work in preparing to start is obviated, there being no rotary fan or pump to continuously work by hand, no electric battery to ignite, no vapor to attend to, and no reheating of the vaporizer required if at any time it should be necessary to stop the engine for ten minutes or so.

The plan of working is as follows: To start the engine an automatic lamp (one of which is supplied with each engine) is used to externally heat the vaporizer and igniter, which occupies from five to ten minutes for all sizes. The lamp is then extinguished, there being no further use for it, simply because the igniter and vaporizer are maintained at the proper heat by the action within the engine, which is kept running by an automatic supply of oil, this supply being controlled by the governor.

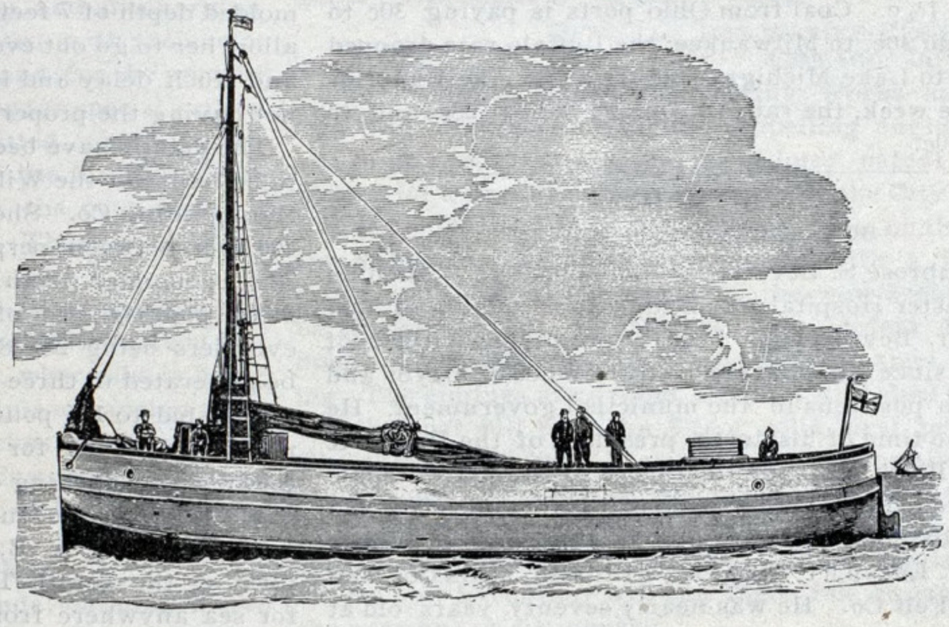
Each engine is thoroughly tested as to the consumption of fuel and the brake or actual horse-power, which is certified and guaranteed before sending out. After erection the engine can easily be worked by unskilled persons.

These engines are made in horizontal and vertical types for stationary purposes, and the firm also manufactures a very efficient portable engine for agricultural purposes. That shown in the illustration is, however, the Thistle patent marine oil engine, which is made with one two, three, or four cylinders, developing from one to three hundred horse-power. The firm makes a specialty of building launches and barges fitted with their marine engines. The illustration shows their type of steel oil-motor barges, ranging in length from 40 to 100 feet, and with capacities from 50 to 200 tons deadweight. The largest size, it will be noted, is almost precisely that of the barges of the Cleveland Steel Canalboat Co., which the boat shown in the illustration very much resembles, save that the auxiliary canvas is not carried by the Cleveland-New York barges.

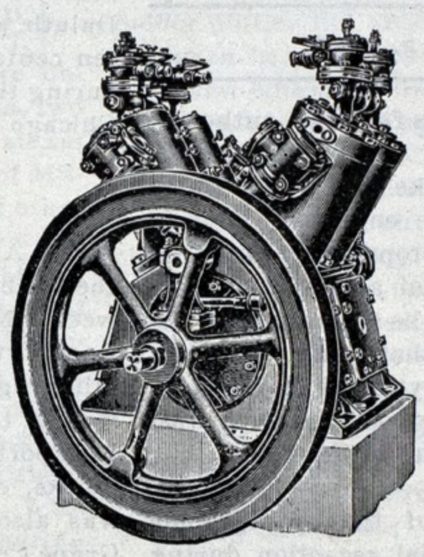
The traffic in their oil and gas engines has grown so rapidly, that Bow, McLachlan & Co. have recently made extensions to their works, which now cover 20 acres, and they have fitted up special tools for manufacturing these engines on an extensive scale. They have at present numerous orders from both home and foreign patrons, and have shipped engines to Brazil, India, Russia, and France, the reports and testimonials received from their engines being highly satisfactory.

Another oil engine manufactured in Great Britain is known as the Priestman. We regret being unable to reproduce a very poor half-tone of this engine, this being the only illustration at present at our disposal. The Messrs. Priestman applied their well-known engine to marine propulsion very soon after its appearance on the market. The adaptation was quite successful, but the full advantages of the system were not gained, since single-acting engines were used, as in the case of engines for land service, where the necessity for keeping down the weight is not so urgent.

Recently, however, the Messrs. Priestman, whose establishment is in Hull, Eng., have modified their marine type of oil engine, making it double-acting, and



BARGE PROPELLED BY OIL ENGINE—THE THISTLE OIL ENGINE.



as there are two cylinders, two impulses are thus given every revolution. For equal weights the power of the engine is about twice that of the old type, an additional saving being effected in the size of the fly wheel, which it has been made possible to reduce to very moderate dimensions. One of these engines, indicating 90 horse-power, has been fitted on a fishing boat, and has been found to have many advantages. It is managed by a seaman who is not an engineer, and can be started at fifteen minutes' notice. The space taken up is much smaller than would be required for a steam plant of equal power. The oils used are the ordinary lighting oils, which are stored in a reservoir at the base of the engine. By means of air pressure a jet of the oil is forced through a spraying device into a heated chamber known as the vaporizer, the temperature of which is maintained, when the engine has been started, by the exhaust gases. In this chamber the oil is mixed with an adequate supply of air, and the whole is then drawn into the cylinder by the idle stroke of the piston, compressed on the return stroke, and then fired by either an electric spark or a tube igniter. The cylinders are kept lubricated by the oil itself, and require no additional supply. All the valves are of the mushroom type. It has been found advisable to arrange the cranks opposite to each other. In this way the engine is very perfectly balanced, and the vibration reduced to a minimum. A governor is fitted which controls the speed of the engine by adjusting the supply of the combustible charge according to the work to be done. The only objection is that the engines run all the time in the same direction, necessitating the use of a reversible propeller, of which, however, there are some very good and convenient types now manufactured.

NEW HYDROGRAPHIC CHARTS.

The Hydrographic Office has just issued three new charts which are of the greatest importance to the ships engaged in the coal, grain, and ore commerce of the Great Lakes. One of these is a new chart of Detroit River from Bar Point light to Mamajuda light. It is somewhat similar to the former Hydrographic Office chart of this river, but is not printed in colors, the shallow depths being shown by shading similar to the U. S. engineers' charts. The scale is considerably larger, and the chart is accompanied with a chart of Limekiln Crossing and vicinity, projected on an unusually large scale. This chart is corrected up to June 26, and the price is $1.

Second to none in importance is a large chart of Pointe au Pelee passage, projected on a scale of about 4 inches to the mile, and made from the surveys made by the U. S. S. Michigan last year, but is corrected to June 26. It includes the dangerous group of boulders known as Grub Reef, and the Middle Ground, and stretches as far eastward as Southeast Shoal which has given so much trouble during this period of low water. Owing to the great expense involved in making the survey and compiling this chart the Hydrographic Office finds it necessaay to charge $1.50 per copy.

The third of the new charts is that of the entrance to South Chicago Harbor, the chart really covering the entire course between the Chicago River and the Calumet. It will prove especially valuable to vessels bound tither from Two Harbors with ore on wild charters, in cases where masters have not been near the Calumet for years. The South Chicago chart sells for $1.

When we say that all these charts are "corrected" to date, we do not mean that they were originally erroneous. The Hydrographic Office notes on its entire stock of charts any new information gathered between the time of publication and of consignment to agents, and the chart is thus kept as much up to date for the purchaser as if it were fresh from the lithograghic press. The Hydrographic Office sells none of its publications except through agents. The MARINE RECORD Publishing Co. is the duly authorized agent of the Hydrographic Office, which fixes all prices. The funds derived from the sale of charts go directly to increase the efficiency and scope of the Hydrographic Office. Orders sent to us will receive prompt attention. Address MARINE RECORD Publishing Co., Western Reserve Building, fourth floor, Cleveland.

THE LOSS OF THE DRUMMOND CASTLE.

The Liverpool Journal of Commerce includes the following in its editorial comment upon the recent loss of the steamer Drummond Castle, which sacrificed so many lives:

"One thing we may say at once, and that is that the daily press has no ground for assuming that the subdivision of the vessel was in any way accountable for the rapidity with which the vessel went down. The bulkhead system of the Drummond Castle was equal to the best practice of the day at which she was built, and she was designed and constructed by the firm who built the Arizona. What their bulkheads will stand was practically proved when that well-known vessel ran end-on to an iceberg at great speed, and safely carried herself and those on board of her to port. No system of bulkheads will stand such a test as that to which those of the Drummond Castle were put. The vessel apparently charged a reef and cleared it. Every compartment she had must have been holed. If she had had a hundred bulkheads the result would have been the same if the whole bottom of the ship were torn away. Then, what is science's safeguard against such an eventuality as that which befell her? A double bottom is the only resource, but we cannot say that even that would have been effectual. The distance between the two skins is, and must be, limited, and if the fangs of the reef were high enough to tear out the inner bottom as well as the outer that safeguard would be useless."

MARINE RECORD

(ESTABLISHED 1878.)

PUBLISHED EVERY THURSDAY BY

THE MARINE RECORD PUBLISHING CO.,

[INCORPORATED.]

GEORGE L. SMITH, President,

C. E. RUSKIN, ... MANAGER.
W. L. MCCORMICK, ... EDITOR.
THOMAS WILLIAMS, Chicago, . . . ASSOCIATE.

CLEVELAND, WESTERN RESERVE BUILDING, FOURTH FLOOR.

CHICAGO, ROYAL INSURANCE BUILDING, ROOM 308.

SUBSCRIPTION.

One copy, one year, postage paid, . . . $2.00.
One copy, one year, to foreign countries, . $3.00.
Invariably in advance.

ADVERTISING.

Rates given on application.

All communications should be addressed to the Cleveland office.

THE MARINE RECORD PUBLISHING CO.,
FOURTH FLOOR, WESTERN RESERVE BUILDING,
CLEVELAND.

Entered at Cleveland Postoffice as Second-Class Mail Matter.

CLEVELAND, O., JULY 2, 1896.

IT seems a great pity that Congress failed to authorize a survey and report on the matter of raising lake levels, by means of a dam at the foot of Lake Erie, a plan which has the unanimous approval of lake engineers. It now seems that part of Buffalo's big appropriation might be diverted to the construction of part of a dam, with more benefit to Buffalo harbor than could be secured by its expenditure for dredging. It seems that some action on this line will be taken in a very few years at the farthest and an enterprise of such moderate cost and such vast benefits ought not to be treated with indifference.

COMMANDER SIGSBEE, in charge of the hydrographic service, is meeting with a very cordial reception during his visit to the lakes, and is making friends for the Hydrographic Office and its work everywhere he chances to call. This work is getting to be more thoroughly appreciated every season. The branch offices on the lakes are meeting with great success in their efforts to secure, through the co-operation of vessel masters, the proper data on which to study the fog belts which are supposed to follow certain as yet unknown laws in extent and location. It will require the dilligent accumulation of this data for two or three years before much can be made of it, but should any certain laws regarding the extent of fogs over definite localities during certain months of the year be discovered, it would prove of incalcuable benefit to the lake commerce.

THE commercial fleet of the Great Lakes is very seriously handicapped between the carelessness—it might be termed vindictiveness—of the rafting interests,and the carelessness of the Lighthouse Board. Private lights and buoys, which are unofficially recognized to be of as great service to navigation as are the government lights, are carried away from time to time by rafts, and no trouble is taken by these depredators to even report the damage they have done. The Lake Carriers have no way by which they can secure recognition and protection for these lights, although they are willing, for the present, to bear the expense of their maintenance. The Lighthouse Board seems indifferent to all requests for more lights, even when they are asked for points of such recognized importance as Crisp's Point,where the Life-Saving Service, a branch of the same department of government, long ago saw fit to establish a life-saving station. The Lake Carriers receive at least courteous treatment from the administration on the other side of the lakes, and the officials have great hopes of securing even more co-operation soon from the Dominion government.

THE FREIGHT SITUATION.

Ore freights have literally gone to pieces. There is no milder term for the present condition of rates, and the worst of it is that the situation is not likely to mend for a month or more. During the past week the rate from the head of Lake Superior has gone down, by a series of 5c drops, to 65c, and Escanaba pays only 45c. The fact that the weather all season has been very good has allowed all classes of boats to run with great regularity, and there is little doubt that of the 6,000,000 tons already sold for this season's delivery, nearly all has been covered, by contract, or by wild loads that have already been brought down. There is little to relieve the situation now except further ore sales, which, it is thought, must come before the end of August. The boats can carry larger cargoes than they could in the spring, and will thus lose less money than they otherwise would at present rates; but the situation is enough to start some talking of tying up boats for awhile.

There seems, however, to be rather a more active movement at the mines than there was in the spring. The large force at the Norrie, which was laid off for several weeks, has been at work again for a month, and other mines in the vicinity are working with larger forces than earlier in the spring. The Ashland Aurora, and Newport mines, in the same district are all shipping heavily, and the low freights will keep the ore coming down the lake; but that is all the worse for the boats if rates do not improve. The grain movement is extremely slow, and coal is not going forward in the same volume it was a month ago. The Duluth wheat rate is now only 2c to Buffalo, with shipments light, and the Chicago-Buffalo corn rate is only fairly steady at 1¼c. Coal from Ohio ports is paying 30c to Duluth, and 40c. to Milwaukee; the Buffalo rate dropped ten cents to Lake Michigan and five to Lake Superior during the week, the rate to Duluth being 25c and to Chicago 40c.

OBITUARY.

HON. AMBROSE S. BEVERLY.

Hon Ambrose S. Beverly, of Lockport, N. Y., died in the Rochester Hospital on Wednesday evening of last week. Mr. Beverly has been a prominent citizen of Lockport since 1847, having held the office of mayor and other high positions in the municipal government. He was, at the time of his death, president of the Boston & Lockport Block Co., manufacturers of standard tackle blocks, etc., and of the Lockport Hydraulic Co., and was also extensively interested in the Niagara White Grape Co., Lockport Pulp Co., Franklin Mills Co., and Lockport Felt Co. He was nearly seventy years old at the time of his death. He was married 25 years ago to Miss Adelaide Currier, who survives him.

PRESIDENT UHLER ON THE GREAT LAKES

National President George Uhler, of the Marine Engineers' Beneficial Association, is spending his midsummer on the lakes. He has recently visited the engineers' lodges at the principal lake ports, and is now located at the Sault, where he is meeting as many of the lake engineers as possible. President Uhler is very popular with the order, and has always acted so as to merit the high degree of confidence reposed in him.

We have this week received the first issue of The Shipping World, London, in its new weekly form. The magazine presents a handsome typographical appearance, and its more frequent issue has not weakened its editorial strength. The current news of maritime England is ably followed, together with important doings on the continent. Major Evan R. Jones, the editor, is to be warmly congratulated upon his new departure.

The Mutual Transportation Co., whose steamer Corsica recently struck the Smith & Post in Detroit River, have given her owners a check for $1,500 in full payment.

AN article describing an oil marine engine appears elsewhere in this issue, and will, no doubt, be read with great interest by those interested in traffic on small craft. The statement that the cost of running the Thistle engine is about one cent per horse-power per hour, is, we believe, an error, as that amount per day would more nearly correspond with the price of oil, and the amount usually used in engines of this description.

SHIP BUILDING AND REPAIRS.

THE COMING YEAR'S WORK.

Notwithstanding that the outlook just at present for vessel property seems very gloomy, there is every prospect that lake shipyards will be kept fairly busy on a number of vessels to be be turned out for next season. There is little in the wind, so far as private parties are concerned, just now, but proposals will soon be invited on the two new revenue cutters which Congress has provided for the Great Lakes, and which will be almost duplicates of the revenue steamer W. Q. Gresham, now in course of construction at the Globe shipyard, Cleveland. The bidding on these boats will doubtless be pretty lively, and both may not go to the same yard, although the character of the work is such that a better bid could be made on both than on one.

The Montreal Transportation Co., of Kingston, authorize THE RECORD to say that they are about to lay the keel for another new schooner, which will be about the same size as the Melrose, now nearing completion. The steamer Rosemount, building in England, is rapidly nearly finished. An account of her launch, on June 10, will be found elsewhere.

There has been some inquiry from Buffalo in regard to ship material during the past ten days, but it is not believed that anything further than some figuring is being done, for the present at least.

Col. Jared A. Smith is using his best efforts with the War Department to secure permission to construct a steel survey steamer to take the place of the Swansea, which is only 90 feet long by 18 feet beam, with a molded depth of 7 feet. Her draft is not sufficient to allow her to go out even in moderately heavy weather, and much delay and loss to the department result from not having the proper sort of a boat.

The details have been decided on for the new steamer to be built for the Wilson Transit Co., by the Cleveland Shipbuilding Co. She is to be 420 feet long over all, and 400 feet between perpendiculars, by 48 feet beam and 28 feet moulded depth. Her engines will be the builders' most popular size of the triple-expansion type, the cylinders being 23, 38, and 63 by 40 inches. Steam will be generated in three Scotch-type boilers, 12 by 12 feet, and tested to 175 pounds working pressure. Work will not begin on her for some months yet, but she will be ready by the opening of navigation, 1897.

The steamer Queen City, building at the Cleveland yard for Capt. A. B. Wolvin, of Duluth, and others, forming the Zenith Transportation Co., will be ready for sea anywhere from to-night to Saturday morning. Capt. Wolvin arrived to-day, and will probably take her up light to load ore. She is painted an olive green, and is a handsome ship. Frames on the James Watt are being put up, and her bottom is nearly completed. Twenty-five men are at Chicago, and twenty-five at West Superior, setting up the machinery of the Maricopa and Ericsson.

The Sir Henry Bessemer is nearly finished at the Globe shipyard, and will go into commission early next week, at the latest. She is expected to make a better cargo record than the Coralia, of which she is a duplicate in dimensions. She is a little lighter, and the difference in displacement may be as much as fifty tons. Her sister ship, the Sir William Siemens, will be launched about the middle of the month.

The Detroit Dry Dock Co. has everything out of the way but the two steamers building for the Bessemer Steamship Co., and the whole force at the shipyard and engine works will be concentrated on these until they are pushed forward to completion. The Senator is nearly ready for service.

The whaleback steamer John Ericsson will be launched at the American Steel Barge Co.'s yard on Monday, July 6. The barge Alexander Holey will be launched about two weeks later, and then, it is pretty generally understood, the work of laying the bottoms of another pair of whalebacks will begin for the season of 1897.

The steamship and three barges now building at the South Chicago shipyard are progressing rather uniformly, but a launch may be expected there in a few weeks.

The steam yacht Enquirer left the yard of the Union Dry Dock Co., Buffalo, last week, on Thursday. She blew out a pipe, which disabled her for the time, but it was no trouble nor expense to repair the slight damage.

She promises to be a speedy, as well as a handsome yacht. The steamer Ramapo will be launched shortly at this yard.

The latest news from the Crescent shipyard, Elizabeth, N. J., is that the barges which were sent back to the yard because they were too wide were very easily repaired, and will be in commission again before a week. The remainder of the fleet, will, it is claimed, be in commission before August 1.

The Ashtabula Passenger & Fishing Co.'s new boat, the Effie B., will go into commission July 4. She measures 82 feet in length by 17 feet beam and 8 feet moulded depth, and is licensed to carry 150 people. She much resembles a harbor tug, except that she has a hurricane deck. She is expected to make about thirteen miles per hour.

Messrs. L. P. and J. A. Smith expect to launch the first of their two steel mud scows about July 4.

LAUNCH OF THE ROSEMOUNT.

There was launched on June 10, from the yards of Wood, Skinner & Co., Bill Quay-on-Tyne, near Newcastle, the steel steamer Rosemount, built to the order of the Montreal Transportation Co., of Kingston, Ont., for service on the Great Lakes. As the vessel left the ways she was christened by Miss Lillian Irwin, of Sunderland. The Rosemount is of the single spardeck type, with the following dimensions: Length between perpendiculars, 252 feet; beam, 41 feet; depth, moulded, 21 feet 4 inches. She has a cellular water bottom for her entire length, and is also designed to carry water ballast in fore and after peaks. She will be rigged as a three-masted schooner, and has large hatches, with the most modern facilities for loading and discharging cargo. The cabins are near the stern, with accommodations for the engineers amidship, and for the crew in the forecastle. She has been built under special survey for Lloyd's highest class. She is fitted with a patent direct steam windlass and capstan in the forcastle deck, and a powerful warping capstan on the poop deck, all supplied by Emerson, Walker & Thompson Bros., Limited.

After launching the Rosemount was immediately towed to the engine works of the Northwestern Engineering Co., Limited, at Wallsend, where she is being fitted with a set of engines of the triple-expansion type, having cylinders 20½, 34 and 57 inches in diameter, by 39 inches common stroke, steam being supplied by two large boilers, working at a pressure of 180 pounds.

OTHER LAUNCHES.

LAGONDA.—The steamship Lagonda, building at the yard of F. W. Wheeler & Co., West Bay City, to the order of the Etna Steamship Co., the principal stockholders being Capt. John Mitchell, Philip Morris, of Cleveland, and others, was successfully launched last Thursday afternoon, June 25, at 12 o'clock. Her length over all is 386 feet 9 inches; keel, 366 feet; beam, moulded, 45 feet; depth, moulded, 26 feet 7 inches. Her frames are spaced 24-inch centers. Her water bottom is 54 inches deep, and is subdivided into the usual compartments, with especially good facilities for pumping. The water ballast capacity is 1,500 tons. In general appearance she resembles the steamer J. J. McWilliams, owned by practically the same parties, and her engines are duplicates of those lately placed in the E. W. Oglebay, having cylinders 23, 37½ and 63 inches in diameter, by 44 inches common stroke. She will have three boilers, 12½ by 12 feet. She has a full auxiliary equipment, including electric light plant, steam steering gear, windlass, capstans, etc. She will be commanded by Capt. C. B. Galton, who has brought out the Gratwick No. 1, Sauber and Williams. Mr. Edward Guy will be chief engineer. The work of putting in her machinery is already progressing rapidly, and she will go into commission before July 20.

C. O. STEDMAN.—The tug Stedman, building by the Ship Owners' Dry Dock Co., Cleveland, for Joseph Duherst and others, of Huron, was launched stern foremost from her stocks near the dock last Thursday afternoon. She was towed to the Globe shipyard, where she received her new firebox boiler, built for her by the River Machine and Boiler Works (Teare & Thomas). Clough & Witt are rapidly getting her engine into place, and then her builders will lose no time getting her house on. She will be used for harbor towing at Huron. Her dimensions were given last week. She is about the same size, with almost the same power as the Alva B.

VENCEDOR.—The Racine Boat Manufacturing Co. launched, last Saturday, June 27, the sloop yacht Vencedor, with which the Lincoln Park Yacht Club will race the Royal Canadian Club's yacht, Canada. Commodore E. C. Berriman, of Chicago, is the owner of the Vencedor. The launch was celebrated with salutes from several yachts which were present, and the yacht was christened by Miss Helen Reynolds, daughter of Secretary Reynolds, of the Racine Company. She was constructed with a great deal of secrecy, but in hull design is practically a large canoe, with a rather flat floor. An enormous fin keel, with the lead ballast carried in a bulb along the lower edge, is a feature of the yacht. Her length on water line is 44 feet 7½ inches; length on deck, 66 feet; beam, 12 feet 2 inches. The interior arrangements are rather more comfortable than is usual for a racing yacht, and will make her an excellent craft for cruising purposes. From a salon 7 feet long by 12 feet wide opens the owner's stateroom on the starboard side, while a toilet room is equally convenient on the port side. Between the two is a passageway leading to the galley, which will be equipped with a wrought steel range on an ice-box, with ample storage for provisions, wet or dry. Immediately forward of the galley are the crew's quarters, with mess table and berths for five men. In the main saloon are luxurious divans which can be converted into beds at night, and Pullman berths, above, arranged to be closed in daytime.

MILWAUKEE'S NEW FIREBOAT.

Special Correspondence to The Marine Record.

OFFICE OF THE MARINE RECORD,
CHICAGO, July 1.

The Charles F. Elmes Engineering Works have obtained the contract to build the propelling engines, two sets of pumps, air pump, and an Elmes' patent steam steerer for a new fireboat to be built for the City of Milwaukee. They are to be duplicates of those on the other two Milwaukee fireboats now in use, with a few improvements. The dimensions of the new fireboat will be 105 feet over all, by 24 feet beam, 12 feet depth of hold; to be built of wood and covered with steel sheathing. The engines are double, 18 by 20, with steel frames, and the boat will have an 8-foot solid steel propeller. The pumps will have a capacity of 6,000 gallons per minute, and the new boat when completed, will, without doubt, be the finest fireboat in the United States. With this and other contracts, the C. F. Elmes Engineering Works now have, they will run their full capacity for the next five or six months.

A dock trial of the new compound engines recently built and placed in the Goodrich Transportation Co.'s new steamer Iowa was made at Burger & Burger's shipyard at Manitowoc last week and they worked very satisfactorily. The engines were built by the Chas. T. Elmes Engineering Works.

GENERAL REPAIR WORK.

CLEVELAND.—After a little dullness, repair work at this port is picking up decidedly. The schooner Olive Jeannette, which had her cabins burned off on Lake Superior, is in the Cleveland dry-dock. She has been receiving some hull damage as well, and it was found necessary to give her a new forefoot, calk her butts and make some minor repairs to her rudder, besides renewing her cabins. Some new planking and bulwarks will run the total cost of repairs to about $5,000. Capt. C. E. Benham represented the owners on the survey, and Capt. Dan McLeod the underwriters. The Specular was also in this week for repairs to her rudder and shoe, and it was found that she had broken two planks and one frame near the bilge on the starboard side. These were replaced with new material. The little steamer Skater and tugs Gordon and Sunol were in for new wheels, and the latter got a new sternpipe, which will overcome all the trouble she has given for several months by leaking. The Allie May got some new planking and had some calking done.

The State of Ohio was struck by a mud-scow in the river Tuesday and received such damage to her hull and one of her wheels that the repairs, which were made by the Cleveland Shipbuilding Co., prevented her departure for Buffalo until Wednesday morning..

The Ship Owners' Dry-dock Co., have now docked the steamer Swain which they are rebuilding, and expect to have her completed soon. The fish tug Susie B, and the Cleveland Dredging Co.'s dredge were in dock for some calking.

TOLEDO.—The steamer H. C. Schnoor has nearly completed a thorough rebuild at the hands of Capt. David Dessault, ship carpenter, at Sandusky, and has been brought to this port that she might be put in dock and the job finished. The yacht Minx, which is now owned by Beber Bros., of Columbus, will have her center-board taken out, and will be converted into a keel boat. The ferry steamer Ann Arbor No. 1 is on her way from Frankfort, Mich., to this port, and will go into Craig's dry-dock on her arrival for extensive repairs. She will receive new steel beams and other stiffening material, and a passenger cabin will be built on her.

MILWAUKEE.—The steamer Philetus Sawyer was docked at the west yard last week and a new Sheriffs wheel put on. The propeller City of Cleveland was in the same dock to have her wheel tightened, and the Veronica was docked at the south yard for minor repairs.

DETROIT.—Repairs on the Merida's machinery are progressing steadily. She was docked last Saturday for her new wheel.

WEST SUPERIOR.—The E. C. Pope was docked last week for some slight repairs, and had her bottom scraped and painted. The 137 was in to have light stern damages repaired, and the tugs Buffalo and Williams had some minor work done.

CHICAGO.—At Miller Bros.' Shipyard the schooner yacht Hawthorne was in dock and received a new iron rudder; the schooner H. C. Winslow was in for repairs to her fore-foot and for recalking her butts; the tug Commodore for repairs to her stern-bearings and a new rudder pintle; the steamer A. G. Lindsay for repairs to her stern bearings; the canal boat First National for some new bottom plank and calking.

The Independent Tug Line's floating dry-dock at the Illinois Central Slip C, is being kept busy. The tug C. M. Charnley was in for repairs to stern bearings and some calking and ironing; the schooner yacht Idler for cleaning and painting her bottom; the tug Ruby for repairs to her stern bearings and some calking. The yacht Idler is also receiving a new foremast.

INLAND LLOYDS SUPPLEMENT.

General Manager Daniel M. Leod, of Inland Lloyd's, has issued supplement No 3 to the vessel register, under date of July 1, entries of ratings and values on vessels being as follows:

Sidewheel steamer Pearl, A2, $16,000.

Propellers—Abercorn, B1*, $10,000; Aragon, A1, $135,000; Bessie, B1, $4,500; Britannic, A1*, $60,000; Foster, I. N., B1*, $8,000; Hattie, A1, $6,500; Annie Laurie, A2, $7,500; E. W. Oglebay, A1, $215,000; Margaret Olwill, B1*, $18,000; Pathfinder (yacht) A1, $70,000; Sentinel (yacht) A1½, $20,000; Sanilac, B1, $10,000.

Tugs—W. & J. Connell, A1, $8,000; Elk, $10,000; S. M. Fischer, A1, $50,000; James T. Martin, A1, $8,000; George D. Nau, A1, $16,000.

Schooners—America, B1*, 2,000; Black Hawk, B1*, $1,500; City of Sheboygan, A1, $4,000; Charles Chambers, A2, $2,000; Commerce, A2, $7,000; L. L. Hammond, A2, $5,000; Thomas H. Howland, A2½, $3,500; Lake Forest, A2, $6,000; John Miner, A2½, $4,000; Minnie Mueller, A2, $3,500; John O'Neil, A2½, $12,000; Penoka, A2, $4,500; W. H. Rounds, A2, $4,500; J. V. Taylor, A2½, $2,000.

Barges—Abyssinia, A1*, $85,000; Algeria, A1*, $85,000; William Brake, A2½, $3,000; C. M. Burlin, A2½, $6,500; Lyman Casey, B1*, $1,200; Eleanor, A2, $12,500; Evaline, B1*, $1,800; Iron City, A1½, $25,000; Maize, B2, $1,000; Moonlight, A2, $20,000; Roscius, B1½, $1,200; Jane Ralston, B1, $3,000; Vinland, A1*, $48,000.

THE DEFENDER'S BRONZE PLATES.

ALL VIEW, NEW ROCHELLE, N. Y., June 25, 1896.

Mr. G. Douglas Petrie, Agt.

Parsons Manganese Bronze & Copper Co.,
56–58 Liberty St., New York City.

DEAR SIR: In reply to yours of May 21 regarding the general condition of the manganese bronze plates of the Defender, I am glad to say I have made a thorough examination of the hull, both above and below the water-line and find the manganese bronze plates supplied by your company to be in perfect order and to all appearance as good as when first placed on the vessel.

Very truly yours, C. OLIVER ISELIN.

CORRESPONDENCE.

☞We do not hold ourselves responsible in any way for the views or opinions expressed by our correspondents. It is our desire that all cides of any question affecting the interests or welfare of the lake marine should be fairly represented in THE MARINE RECORD.

MECHANICS THAT ARE NOT MECHANICS.

To the Editor of The Marine Record:

In the last issue of the MARINE RECORD there appeared on Page 6 an article on steel shafts, copied from Engineering Mechanic. The article referred to is intended to give some valuable information on the subject of steel shafts, but in fact it gives anything but that.

It first says, "the fact that steel shafts break from the outside instead of the inside goes against the microscopical examination of minute bits of interior of the shaft." What this means it would be impossible to say without the aid of some diagram, or a key to what the writer of the above had in his mind when he wrote that supposed piece of information. The uninitiated would naturally conclude from reading this part of the article that the breakage of steel shafts occurred in some peculiar or mysterious manner, different from a plain every-day kind of a break; and in order to determine whether it broke from the outside in or inside out, the engineer would have to gather up minute bits of the interior of the shaft and see if they went against the microscopical examination. What information a practical man could get out of such a proceeding would be very microscopical indeed.

Second, it says, "one steamship engineer who had put in 110 steel shafts in 14 years, one of which has run 1,000,000 miles and was still good, did not take any interest in the microscope." Now what is to be understood from this, farther than that a shaft, whether steel or iron, that had run the above number of miles must be an exceptionally good one. The subject throws no light on the seemingly puzzling question whether the shaft breaks from the outside in or inside out, or what was at fault in the matter.

Third, it says farther, that "naval engineers in England, who have been going over the whole question, think breakage is generally due to fatigue, a correct view, because steel has nerves just the same as human beings." What do we learn from this more than that when a shaft breaks it does so simply because that when overloaded and under long continuous vibrations it gives way, which is a theory that almost anyone can understand and need not be shrouded in mystery?

Fourth, it says, "some engineers still favor boring out shafts in order to take away that part containing defects in casting, but this is not a general rule, because often the best part of the steel is toward the center of the shaft and not on the outside. In cooling off a steel casting, the sulphur and carbon collects in the center of the shaft, and not on the outside." Now, if the defects are at the center of the shaft, how is it possible that that is the best part? And if the defects are at the center, what objections could be made to its removal? If the carbon and sulphur collect in the center no objection should be made to their removals. While, in fact, its carbon may vary according to the purpose to which the forging will finally be applied, its phosphorous and sulphur should not exceed 0.04 per cent, in order that the metal should be sufficiently worked to give it strength and toughness, the two important elements required to withstand the greatest amount of fatigue. The true reason why the center of the shaft in all cases is not removed is that it adds largely to the cost, so much so that the additional expense is not warranted except in special casts.

Fifth, it continues, "forgings need annealing just as castings do, but if steel were put in an annealing furnace it would be ruined." Now, why this contradiction? If it is necessary to anneal a steel forging (and it is) that strains set up in forging may be reduced, and all important and intricate steel castings should be annealed to reduce the internal strains produced by the melting and cooling of the metal. Just why a steel casting should be ruined by annealing the author does not attempt to make clear.

Sixth, it says: "One eminent engineer declares the proper way to make a steel shaft is with the hydraulic press." Undoubtedly this is a correct view to take, and it is equally true in forging iron shafts as well. By this method of forging it is insured that the mass is worked through to its centre, and the benefit derived from such a method of forging is obvious.

And finally it says, "just what fatigue in metal means in a chemical and a mechanical sense is hard to determine." What the writer of this means is equally hard to determine, as we understand the fatigue of any metal refers to the amount of work it will stand and the number of vibrations that can take place before the shaft will break. The fatigue can not have anything to do with the chemical composition of the shaft farther than to regulate the selection of the proportions that experience has shown to be the best. While the fatigue of the metal in a mechanical sense is plain, the amount of fatigue any shaft, whether steel or iron, will stand before giving way is not possible to determine, as the amount of fatigue any two shafts will stand, forged and worked under the same conditions, will not be the same. But the life can best be extended by a careful designing of the original machine, and by a judicious selection of the best materials that can be properly worked to withstand the greatest fatigue. At the present time the metal that can withstand (when properly worked) the greatest fatigue is steel. * * *

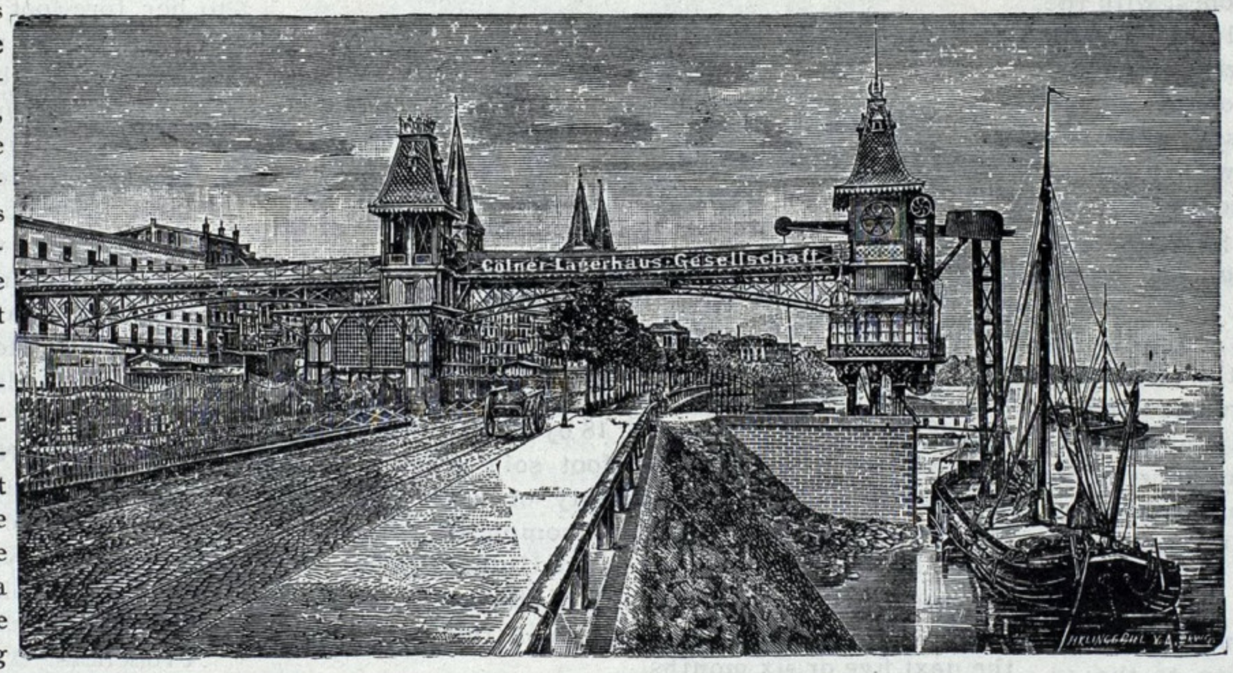
SHOULD BE CORRECTED.

To the Editor of The Marine Record:

I have always been an admirer of your valuable paper for its reliability in the matter of news. A contemporary of yours on June 11th published an elaborate picture of the Hoyt and barges, saying this steamer's barges were ashore during the past week on Chequamegon Point. The Hoyt was not within 400 miles of Chequamegon Point when those barges were ashore. Will you do me the favor to waken those people up, and let them know that they are not so nautical as they think?

MASTER OF HOYT.

Sault Ste. Marie, Mich., June 23.



GRAIN HANDLING PLANT AT COLOGNE, GERMANY.

GRAIN HANDLING PLANT AT COLOGNE.

We give herewith, by courtesy of the American Elevator and Grain Trade, Chicago, an illustration of an ornate structure at Cologne, Germany, which some of our readers may think was built for a temple; but they are mistaken. It was built for just what it is now used for—a grain storage and handling plant.

The principal part shown is the towers and the conveyor gallery. The marine leg is at work unloading a scow on the River Rhine. The plant is the property of the Cologne Grain Storage Co., and was erected by G. Luther. The marine leg is driven by a gas engine. The grain warehouse is 270 feet from the quay. It has forty bins, with an aggregate capacity of about 115,000 bushels. The elevating capacity is 40 tons, or 1,350 bushels per hour. Warehouses where grain is stored on the floor are attached. These houses have room for 2,500 tons, making the total storage capacity 6,000 tons, or 200,000 bushels.

The Menominee vessel loaders' union has raised the price of loading lumber to 50c per hour.

TRADE AND INDUSTRIAL NOTES.

The Babcock & Wilcox Co. announce that on July 1 they will consolidate their Canadian sales department with their general sales department at New York City. No change will be made in the manufacturing department, and the Canadian shops will be maintained, and all boilers built there as at present. Mr. Wm. T. Bonner, resident manager at Montreal for nearly two years past, will remove to Atlanta, Ga., after closing up the Montreal office, having been appointed manager for the same company's south-eas'ern territory. Although this district comprises but six states, North Carolina, Tennessee, South Carolina, Georgia, Alabama and Florida, the total area of which is but little larger than the Province of Quebec, the population is double that of the entire Dominion of Canada.

The steam yacht Kanawha, designed and built by Charles L. Seabury & Co., Nyack, for John P. Duncan, had her official trial trip Tuesday. The guaranteed speed in contract was 16 miles per hour for three consecutive hours over a measured course, and without the least trouble she attained a speed of 17 miles per hour for the time mentioned, everything working to perfection. The engine is a Seabury design triple-expansion, and the boiler of Seabury's latest improved type. The principal dimensions of the Kanawha are 140 feet over all, 115 feet water line, 17 feet beam, 7 feet draft. Capt. William A. Miller is in charge. Chief engineer is John Vinal. The Kanawha was described and illustrated in THE RECORD of March 26.

The Illinois Steel Co. has declared a dividend of 1½ per cent upon its capital stock of $18,650,635. The officers of the company report its condition much better than it was at any time last year. The strike has had little if any effect upon the company so far. This second dividend of 1½ per cent comes within four months of the preceding one, which was the first dividend paid in months.

The Detroit Lubricator Co. has issued a pamphlet descriptive of a full line of globe and radiator valves, including quick-opening steam valves. These latter are new, and sectional views are given that will prove interesting.

A baby liquid compass that pleases in size, price and performance, is the latest thing out for small yachts and canoes. It is supplied by T. S. & J. D. Negus, 140 Water Street, New York.

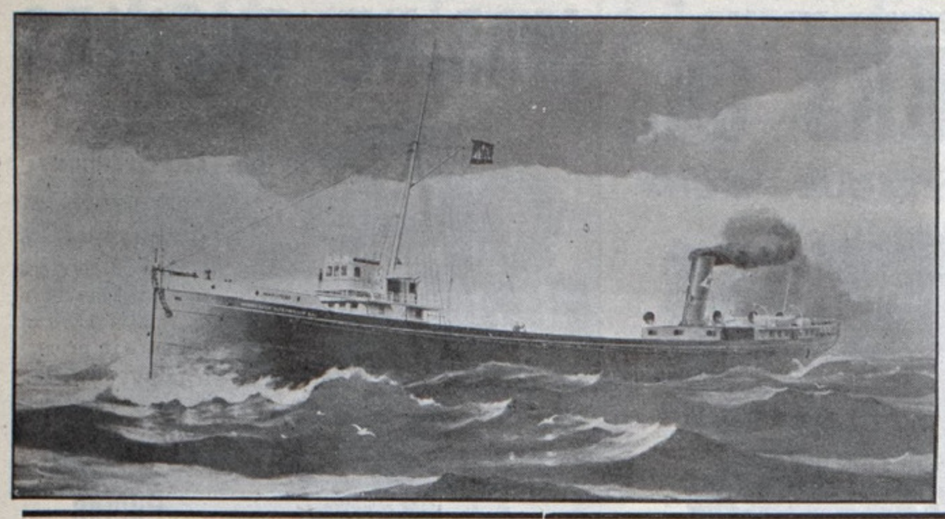
THE LIBRARY TABLE

Mr. W. Bell Dawson, C. E., in charge of the government survey of tides and currents in Canadian waters, has issued another comprehensive report of his progress, which is full of the most interesting data concerning the peculiar features of the Gulf of St. Lawrence.

The Yale Scientific Monthly for June contains another interesting and thoroughly instructive article from the pen of Mr. H. S. Pickands, entitled "Auxiliary Naval Machinery," dealing particularly with the steering engine, search-light, towing machines, adjustable propellers, new types of anchors, and the use of Pintsch gas buoys. It is accompanied with illustrations of the Rushmore search light and Globe steam steerer.

Marion Crawford give the third of his papers in Rome in the July Century, and also the third and concluding paper of Prof. James Bryce's "Impressions of South Africa." Mme. Campan is the writer of hitherto unpublished history regarding the marriage and execution of Marshal Ney. The frontispiece of the number is a portrait of Bulow, the pianist, concerning whom one of his pupils, Bernard Boekelman, writes a series of reminiscences.

Harper's for July will open with a paper by Woodrow Wilson on General Washington and the period of the revolution. The feature this number will be an illustrated paper on the distinctive characteristics of Ohio, as shown in the development of the state, written by Dr. Charles F. Thwing, president of Western Reserve University, the occasion being the centenary celebration of Cleveland. Henry Cabot Lodge gives a piquant description of English elections, and Lawrence Hutton contributes an attractive article on "Literary Landmarks of Venice." The number is especially strong in fiction.

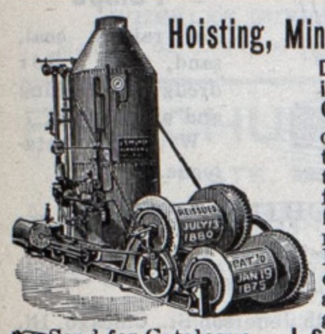


GRAHAM'S

Rapid Fueling Docks, Detroit River, foot 21st Street.

No interference from Passenger or Car Ferry Lines.
Full supply of BEST STEAM COAL always on hand.
Wide stretch of river and plenty of water at dock. POCKETS and CHUTES arranged for various types of vessels, allowing QUICK DISPATCH day or night.

JAMES GRAHAM, DETROIT.



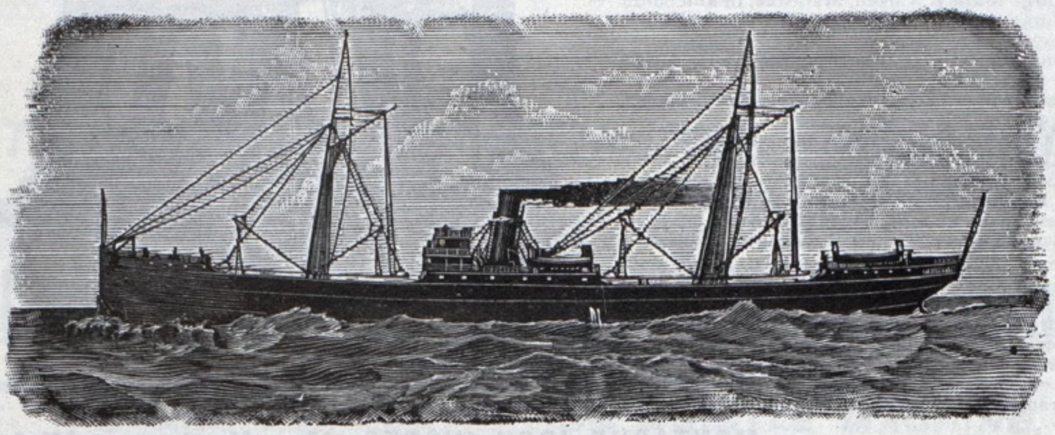
Hoisting, Mining Bridge Erecting

Dock Building, Pile Driving, Coal Hoisting and Quarry Engines.

of any power, sugar cane transferring engines, transferring machines for depositing cane from car to carrier, with my improved Patent Friction Drums, with or without Boilers. Any amount of reference given. Established 1870.

Send for Catalogue. J. S. MUNDY, Newark, N. J.
1744 Market St., Philadelphia, Pa.
22 Light St., Baltimore, Md.
117 Water St., Pittsburgh, Pa.
249 South Jefferson St., Chicago, Ill.
715 North Second St., St. Louis, Mo.
39 Magazine St., New Orleans, La.
34 Fremont St., San Francisco, Cal.
85 Front St., Portland, Oregon.
218 Congress St., Boston, Mass.

F. W. WHEELER & COMPANY.,



BUILDERS OF ALL KINDS OF

IRON, STEEL AND WOODEN SHIPS,

FOR LAKE OR OCEAN SERVICE.

West Bay City, Mich.

F. W. WHEELER, Prest. E. T. CARRINGTON, V.-Prest
C. W. STIVER, Secretary & Treasurer.

FRONTIER IRON WORKS,

MARINE ENGINES,

DETROIT, MICH.

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, PAID UP IN CASH, -	$3,000,000.00.
ASSETS, - - - -	9,487,673.53.

CHARLES PLATT, President.
EUGENE L. ELLISON, 2d Vice President.
WILLIAM A. PLATT, Vice President.
GREVILLE E. FRYER, Sec'y and Treas.
JOHN H. ATWOOD, Assistant Secretary.

Lake Marine Department.

GEORGE L. McCURDY, MANAGER.
CHICAGO, ILL.

MARINE AND INLAND INSURANCE.

Atlantic Mutual Insurance Co.,

Organized 1842. Office 51 Wall Street, NEW YORK.

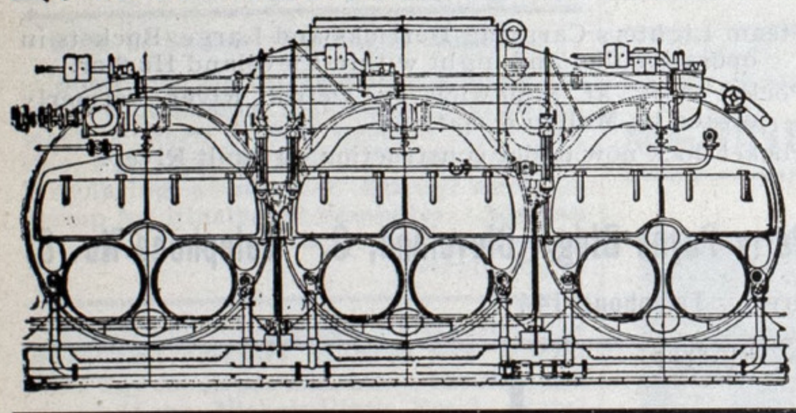
Insures against Marine and Inland Transportation Risks and Issues Policies making Loss Payable in England.

Assets over $10,000,000 for the Security or its Policies.

The profits of the Company revert to the assured, and are divided annually upon the premiums terminated during the year; thereby reducing the cost of insurance. For such dividends, certificates are issued bearing interest until ordered to be redeemed, in accordance with the charter.

J. D. JONES, Pres. W. H. H. MOORE, Vice Pres. A. A. RAVEN, 2d Vice Pres. J. H. CHAPMAN, Sec.

LAKE ERIE BOILER WORKS



The best equipped plant in America for the manufacture of

MODERN MARINE BOILERS.

BUFFALO, N. Y.

PINTSCH GAS LIGHTED BUOYS.

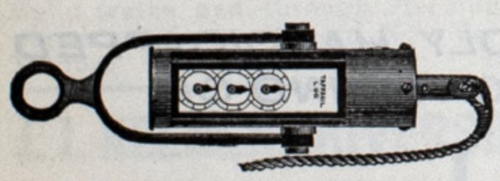
Adopted by the English, German, French, Russian, Italian and United States Light-House Departments for channel and harbor lighting; over 500 gas buoys and gas beacons in service.

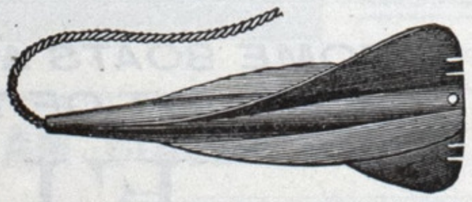
BURN CONTINUOUSLY from 80 to 365 days and nights without attention, and can be seen a distance of six miles.

BRILLIANT AND STEADY ILLUMINATION.
ECONOMICAL AND RELIABLE IN OPERATION.

Controlled by the **SAFETY CAR HEATING AND LIGHTING CO.,**
160 Broadway, NEW YORK CITY.

THE BLISS TAFFRAIL LOG





Over 10,000 have been sold since 1876. A portion are made to indicate STATUTE MILES for use on the Lakes.

The Rotators are adjustable and made by a patented system which gives great stability to the blades. Our Log is being closely imitated, and rotators bearing no name of other marks are offered by the makers to use with our Logs as "just as good as the Bliss rotator."—They are not just as good, either in durability or accuracy.

Our rotators bear our name and the dates of four patents. For sale by ship chandlers.

JOHN BLISS & CO.,
128 FRONT STREET, NEW YORK.

FOR SALE.

SLOOP ···YACHT.

Bran new, 29 feet over all, 17 feet on the water, 8 feet beam, has fin keel with 1,C00 pounds of lead on the same, new set of sails, air chambers enough to float her in case of accident, under deck and out of sight, can easily beat any boat of her class owned in Toledo, O., where there are some of the fastest on the lakes. For further particulars apply to Lock Box 291, Toledo, O.

For Stationary, Portable, Traction Engines, Tugboats, &c.
Thoroughly Reliable—Perfectly Automatic.
JENKINS BROS., - Selling Agents,
NEW YORK, BOSTON, PHILA., CHICAGO.

MARINE ENGINEERING

MINNEAPOLIS SEPT 26 1894 MINN

(Stationary and Locomotive Engineering), Electricity, Architectural and Mechanical Drawing, Plumbing, Heating, Mining, English Branches, etc.

TAUGHT BY MAIL.

Engineers can qualify to obtain licenses. To enroll only necessary to know how to read and write. Circular **free.** State subject you wish to study.
The International Correspondence Schools, SCRANTON, PA.

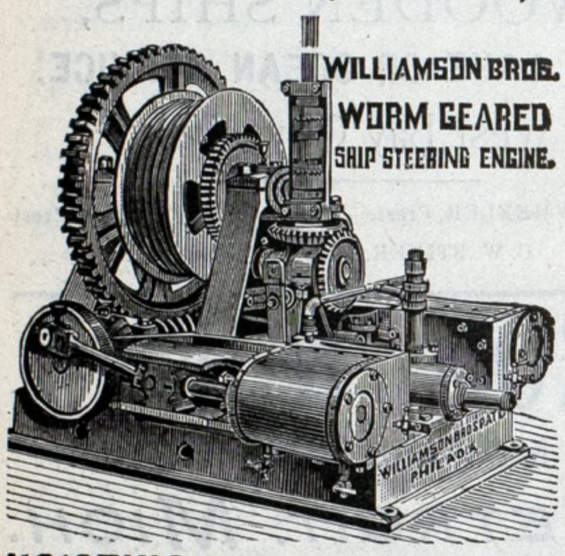
A. J. MORSE & SON.

DIVING APPARATUS

140 CONGRESS ST. BOSTON.

WILLIAMSON BROS.,

Cor. Richmond and York Sts., PHILADELPHIA, PA.



HOISTING ENGINES and SHIP STEERING ENGINES.

With either Frictional, Spur or Worm Gear of Various Patterns to suit all purposes

ESTABLISHED 1871. INCORPORATED 1893.

MONTAGUE IRON WORKS CO.,

MONTAGUE, MICH.

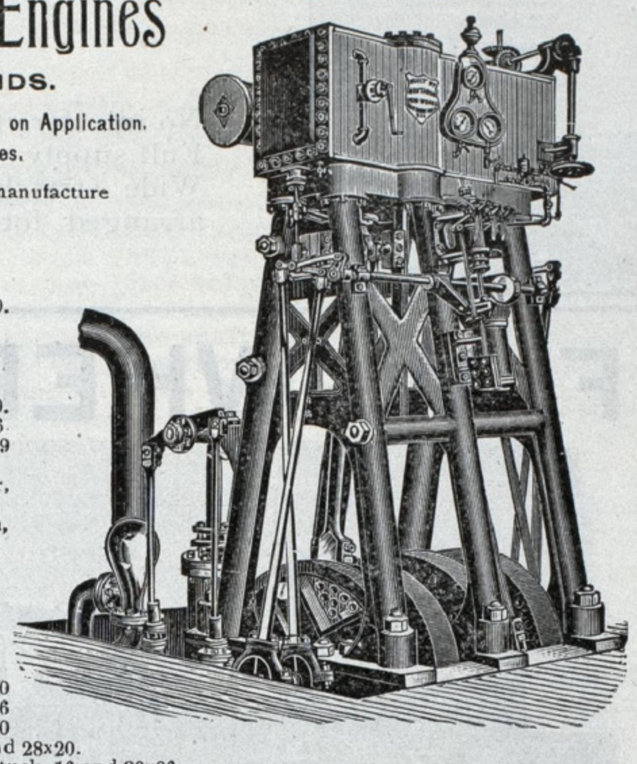
MANUFACTURERS OF

Marine and Stationary Engines

AND BOILERS OF ALL KINDS.

Heavy Castings a Specialty. Prices Quoted on Application.

Fore and Aft Compound Marine Engines.



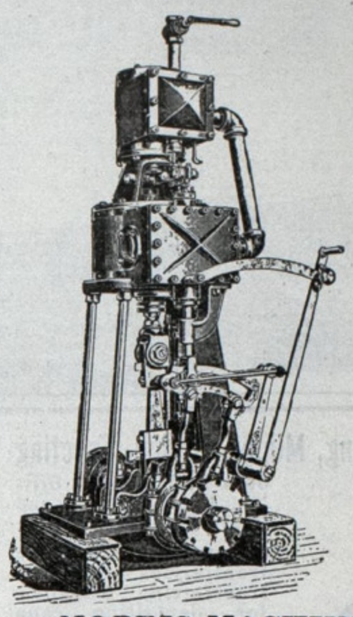
The Engines in the following boats are of our manufacture

Tug, Hunter, Chicago, 15 and 28x22.
Tug, Tacoma, Chicago, 16 and 30x24.
Tug, Zenith, Duluth, 18 and 36x30.
Steamer Glenn, South Haven, 14 and 28x20.
U. S Survey Steamer, W. S. Hancock 12 and 21x20.
Steamer Pine Lake, Charlevoix, 16 and 30x24.
Passenger Steamer Pilgrim, St. Clair, 14 and 28x20.
Steam Barge Iona, Grand Haven, 24 and 46x42.
Steam Barge M. T. Greene, Chicago, 20 and 36x36.
Steamer H. W. Williams, South Haven, 18 and 36x30.
Steam Barge Mark B. Covell, Manistee, 18 and 30x26.
Steam Barge Isabella J. Boyce, Michigan City, 19 and 32x26.
Steam Barge Luella H. Worthington, Cedar River, 19 and 36x30.
Passenger Steamer City of Kalamazoo, South Haven, 20 and 40x30.
Steamer Oval Agitator, Chicago, 14 and 28x20.
Tug E. G. Crosby, Muskegon, 16 and 30x24.
Tug Peter Coates, Sault Ste. Marie, 10 and 20x16
Steamer Lorain L, South Haven, 12 and 21x16.
Passenger Steamer Lotus, Escanaba, 16 and 30x24.
Steam Barge Sachem, Grand Haven, 21 and 38x36.
Passenger Steamer Bon Ami, Saugatuck, 14 and 28x20
Steam Barge Charles A. Street, Chicago, 20 and 36x36
Steam Barge Edward Buckley, Manistee, 18 and 36x30
Passenger Steamer E. G. Maxwell, Pentwater, 14 and 28x20.
Passenger and Freight Steamer Bon Voyage, Saugatuck, 16 and 30x26.
Passenger and Freight Steamer Mabel Bradshaw, Muskegon, 16 and 28x26.

The engraving represents our 20 and 36x36 Fore and Aft Compound Marine Engine. We build them all sizes and guarantee them to give satisfaction. Prices furnished on application.

MONTAGUE IRON WORKS CO., Montague, Mich.

MARINE ENGINES



SINGLE AND COMPOUND.

5 TO 200 HORSE-POWER. These engines are high-class n workmanship and material and moderate in price.

Send for cuts, description and prices.

Centrifugal Pumps

For raising coal, sand, &c. For dredging, wrecking and circulating.

Write for catalogue.

MORRIS MACHINE WORKS,

Baldwinsville, N. Y.

HENION & HUBBELL, Agents,

61-69 North Jefferson St., Chicago, Ill.

ABRAM SMITH. ANGUS H. SMITH.

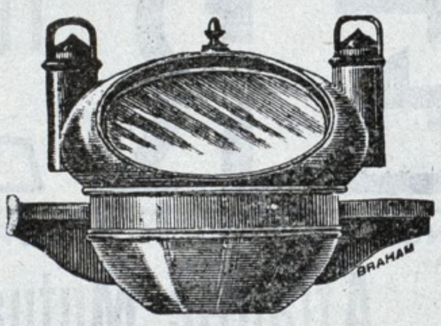
ABRAM SMITH & SON,

SHIP-BUILDERS,

ALGONAC, MICH.

Wooden Ships of any description built rebuilt, or repaired.

Send for specifications, prices, etc. Good slips for laying up boats.



FRANK MORRISON, COMPASS ADJUSTER

AND MANUFACTURER OF

NAUTICAL INSTRUMENTS.

COMPASSES. BAROMETERS, PATENT LOGS, BINNACLES, STEAM GAUGES, MARINE GLASSES, ENGINE INDICATORS.

All Nautical Instruments Carefully Repaired.

Office with Upson, Walton & Co., 161 River St., Cleveland, O.

Extra 4th of July Schedule.

The Nickel Plate Road will run train 19 leaving Cleveland 3:30 a. m. through to Vermillion, account special attractions at Shadducks and Linwood Parks. 139—27

JEFFERY'S MARINE GLUE

Can be Obtained from the Following Well-known Firms

L. W. Ferdinand & Co., Boston, Mass.
Howard H. Baker & Co., Buffalo, N. Y.
Geo. B. Carpenter & Co., Chicago, Ill.
H. D. Edwards & Co., Detroit, Mich.
Upson-Walton Co., Cleveland, O.
M. I. Wilcox Cordage and Supply Co., Toledo, O.

Send for Circulars and Samples.

THE W. L. SCOTT CO.

WHOLESALE DEALERS IN

SHAMOKIN, WILKESBARRE, AND HAZLETON LEHIGH **COALS**

····MANSFIELD STEAM COAL

Fueling Steam Vessels a Specialty. Dock and Office at Canal Dock.

Either from Dock or Steam Scow Mansfield, capacity 300 tons, in buckets, which gives quick dispatch. Boats coaled day or night. Docks lighted with electricity and equipped with Steam Derricks.

ERIE, PA.

The CUDDY-MULLEN COAL CO., Cleveland

DEALERS IN **BEST GRADES OF STEAM COAL.**

SPECIAL ATTENTION GIVEN TO STEAMBOAT FUELING.

SHIPPING DOCK with Car Dumping Machine, also eight chutes holding 100 tons each, for Rapid Fueling within Eastern Arm of Breakwater, Cleveland.

Steam Lighters Carrying Derricks and Large Buckets in operation day and night within Cleveland Harbor.
Pocket dock at Sandwich on Detroit River, formerly owned by Mullen & Gatfield.
Pocket dock now under construction on Sault River.

Main Offices, Perry-Payne Bldg., Cleveland, O. Telephone No. 8.

RIVER DOCK, West River Street. Telephone 1441.

ROBERT E. HILLS,

Steam Fitting and Heating,

Wrought Iron Pipe and Fittings, Engineers' Supplies; General Jobbing Work Done Promptly.

Also Proprietor of North Side Iron Works.

57 & 59 North Wells St. CHICAGO, ILL.

For the 4th of July festivities, the Nickel Plate Road will extend the Lorain Accommodation leaving Cleveland 3:30 a. m. to Vermillion. Celebration at Shadducks and Linwood Parks. One fare for the round trip. 137—27

Handicapped

SOME BOATS ARE BADLY HANDICAPPED FOR WANT OF THE RIGHT KIND OF

FUEL

We have the right kind at our **Amherstburgh Dock,** and will take good care of your wants if you will give us a chance.

O. W. SHIPMAN,

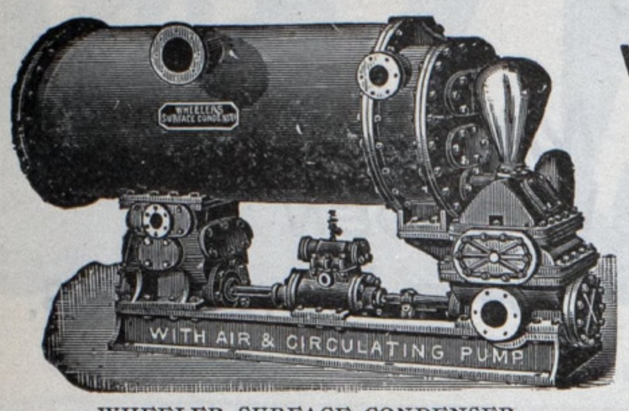
Office, 90 Griswold Street, DETROIT, MICH.

Wheeler Condenser & Engineering Co.,

39 & 41 CORTLANDT STREET, NEW YORK.

WHEELER'S IMPROVED SURFACE CONDENSERS

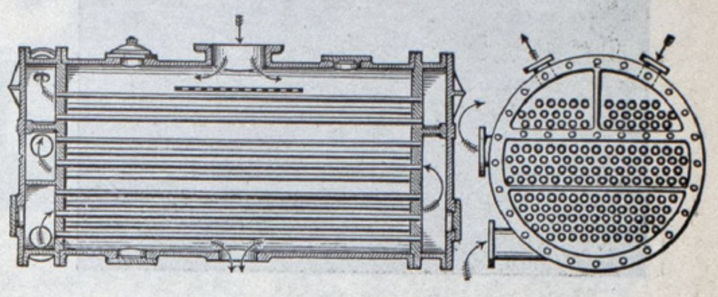
Mounted upon Combined Air and Circulating Pumps.



WHEELER SURFACE CONDENSER,
Mounted on Combined Air and Circulating Pumps.

Sole Proprietors and Manufacturers of the
WHEELER STANDARD SURFACE CONDENSER.
WHEELER ADMIRALTY SURFACE CONDENSER.
WHEELER LIGHT HALL SURFACE CONDENSER.
VOLZ PATENT COMBINED SURFACE CONDENSER AND FEED-WATER HEATER.
WHEELER FEED-WATER HEATER, AIR AND CIRCULATING PUMPS.
EDMISTON PATENT FEED WATER FILTER.

Send for Pamphlet, "Machinery for Small Boats, etc."



PATENT COMBINED SURFACE CONDENSER AND FEED-WATER HEATER.

P. M. CHURCH & CO.

SAULT STE. MARIE, MICH.,

Ship Chandlery,
Hardware, Paints, Oils,

And all classes of
VESSEL SUPPLIES.
Coppersmith Shop in connection.
Corner Portage and Ashmun Sts.
TELEPHONES; - {OFFICE NO. 7. RESIDENCE NO. 4.

EIGHT ELEGANT PHOTOGRAVURES

SIZE, 10 x 17 INCHES.

Whaleback Steamer Christopher Columbus,
STATE OF OHIO—STATE OF NEW YORK,
Steel Ship Builders,
Steamer ARTHUR ORR,
English-Built Steamer TURRETT,
Dry-Dock Representatives,
Schooner JOHN FITZPATRICK.

Complete set mailed to any address on receipt of 25 cents.

THE MARINE RECORD,
Western Reserve Bldg., CLEVELAND, O.

Plan Your Summer Outing Now. Go to Picturesque Mackinac via THE COAST LINE.

It only costs $13.50 from Detroit, $15.50 from Toledo, $18.00 from Cleveland for the round trip, including meals and berths. One thousand miles of lake ride on new modern steel steamers for the above rates. Send 2c. for illustrated pamphlet. Address

A. A. SCHANTZ, G. P. A.,
Detroit, Mich.

D. & C. Summer Service to Mackinac.

Their new steel passenger steamers are all in commission, making four trips per week between Toledo, Detroit, Mackinac, Soo, Petoskey, Duluth. If you are contemplating a summer outing, send 2c. stamp for illustrated pamphlet. Address

A. A. SCHANTZ, G. P. A.,
Detroit, Mich.

Uniformed colored porters attend to the wants and comfort of first and second class day coach passengers on the through trains of the Nickel Plate Road. Rates lower than via other lines. 135—27

You save from $1.50 to $3.00 by purchasing tickets via the Nickel Plate Road. Solid trains and through sleeping cars between Chicago, Buffalo, New York and Boston. 136—27

THE CHASE MACHINE COMPANY.

MACHINISTS, ENGINEERS AND BLACKSMITHS.

MANUFACTURERS OF

Land & Marine Engines & Steam Pumps,

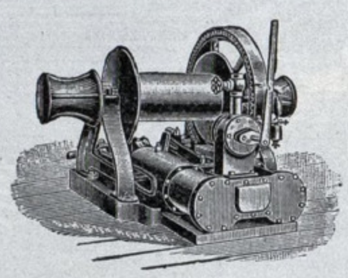
SOLE OWNERS AND MANUFACTURERS OF THE

CHASE AUTOMATIC FOG WHISTLE MACHINE.

IN USE ON NEARLY ALL LAKE STEAMERS.

Agents for ASBESTOS STEAM, BOILER AND PIPE COVERING.

Telephone 994. 111 Elm Street, CLEVELAND, O.



Dock and Deck Hoists.

ALL KINDS OF

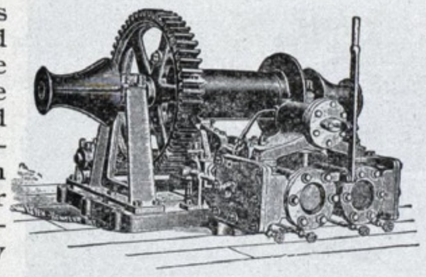
Machinery and Friction Hoists.

JACKSON & CHURCH, Saginaw, Mich.

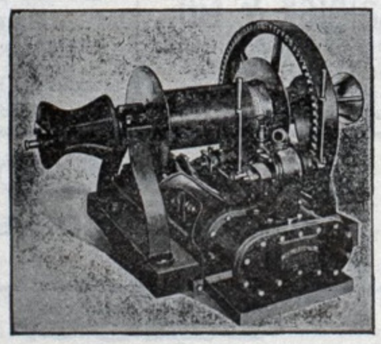
Send for Prices ..and Circulars.

HOISTING ...ENGINES

We build them in all sizes from new and improved designs. Every engine thoroughly tested before leaving our shop, and guaranteed to be satisfactory in every case. When in want of a Hoist for marine work, dock work, mining or any other purpose, kindly permit us to name you prices. We know we can please you.



MARINE IRON CO., - - BAY CITY, MICH.



DECK HOISTS

Coal and Contractors' Hoists,
Steam Steering Gears and
Conveying Machinery
For all Purposes.

MANUFACTURED BY W. H. WHITTEMORE,

WRITE FOR PRICES. *WEST BAY CITY, MICH.*

MARINE GLASSES

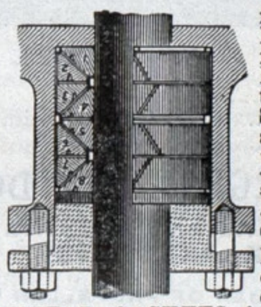
BAROMETERS
COMPASSES
TELESCOPES

Bring Your Repairs to us.
We Repair Everything in the Nautical Line.

FREE Our "card" rules for foretelling weather. Adagted for use with Auroid Barometer. Every vesselman should have one.

L. BLACK & CO., Opticians,
156 Woodward Ave., DETROIT, MICH.

Katzenstein Self-Acting Metal Packing



for Piston Rods, Valve Stems, Etc., of every description, for Steam Engines, Pumps, Etc. Adopted and in use by the principal Iron Works, Steamship Companies, Mills and Engine Builders, Electric Light and Power Plants within the last twelve years in this and foreign Countries. Also FLEXIBLE TUBULAR METALLIC PACKING for Slip-Joints on Steam Pipes and for Hydraulic Pressure. Also METAL GASKETS for all sizes and shapes of flanges. Double-Acting Balanced Water-tight Bulkhead Doors for Steamers. Also Agents for the McColl-Cumming Patent Liquid Rudder Brake.

L. KATZENSTEIN & CO., General Machinists, Brass Finishers and Engineers' Supplies, 357 West Street, New York, N.Y.

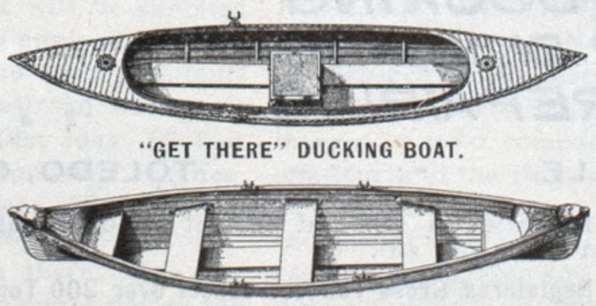
J. J. KEENEN, RIVERSIDE STEAM BOILER WORKS.

Marine, Locomotive and Stationary Boilers.
Marine Work a Specialty. . . . .

SHEET IRON WORK OF ALL KINDS.
REPAIRING PROMPTLY ATTENDED TO.

Office and Works, Cor. Cologne and Fuller Streets,
CHICAGO.

Telephone, Canal 401



"GET THERE" DUCKING BOAT.

DOUBLE ENDER PLEASURE BOAT.

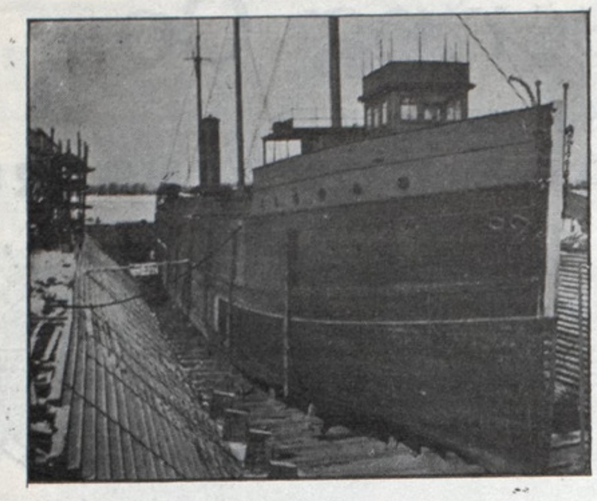
Always Ready for Use.

Mullins' Stamped Metal Boats

Can be depended on, as they do not crack open when exposed to the weather, or become waterlogged and heavy when in use. Beautifully modeled, new in design, need no repairs, low in cost. CATALOGUE ON APPLICATION.

CORRESPONDENCE SOLICITED.

W. H. MULLINS, 252 Depot St., Salem, O.



CRAIG SHIP BUILDING CO.,

TOLEDO, OHIO

New Dry-Dock 450 feet long, 110 feet wide on top, 55 feet wide on bottom, 16 feet water on sill.

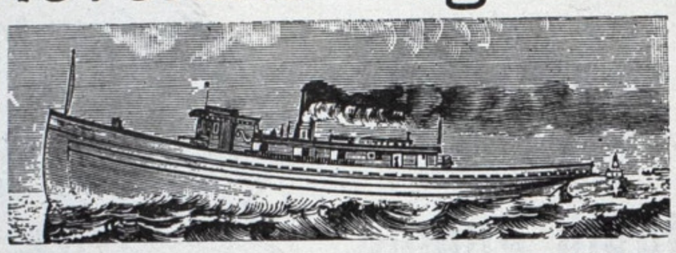
Repairs to Metal and Wooden Ships A Specialty.

METAL AND WOODEN SHIP BUILDERS.

H. A. HAWGOOD, Pres't. PHILIP MINCH, Vice-Pres't. C. A. MORGAN, Gen'l Mang'r. J. A. SMITH, Sec'y. J. R. SPRANKLE, Treas.

The Cleveland Tug Company,

First-class Tugs, Steam Pumps, Divers, Hawsers, Lifting Screws, Etc., furnished Promptly on Orders by Telegraph or otherwise.



Steamers when outside wanting our Tugs, blow one long whistle and as many short ones as they want tugs.

OPEN DAY and NIGHT. Long Distance Telephone 725.

OFFICE 23 RIVER ST. Cleveland, Ohio.

The "CINCINNATI" Automatic STEAM STEERING GEAR

Simple, Powerful Machine. Noiseless and Sure. Send for Circular.

FRONTIER IRON WORKS, Detroit, Mich., AGENTS FOR THE LAKES.

AMERICAN STEEL BARGE CO.

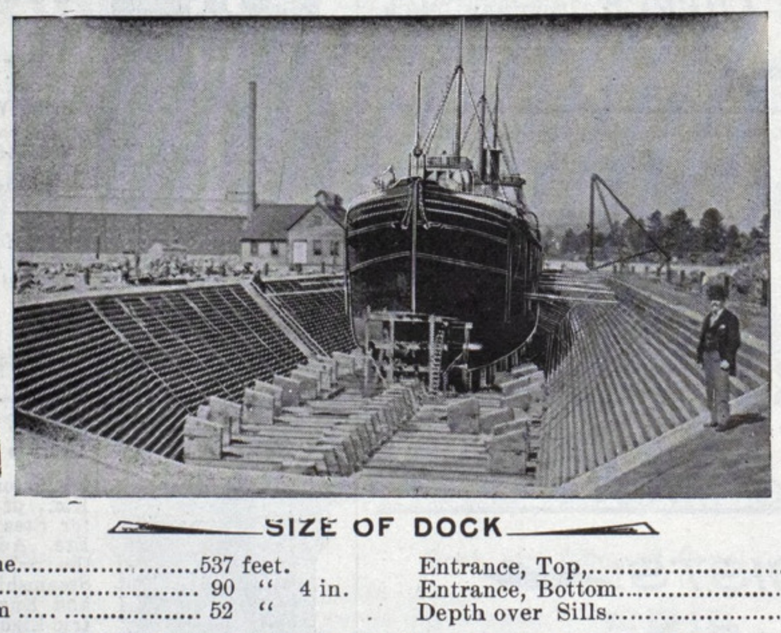
STEEL AND METAL SHIPS

OF ALL CLASSES BUILT ON SHORTEST POSSIBLE NOTICE AT OUR YARDS AT

WEST SUPERIOR, WIS., and also at EVERETT, WASH.

PHOTOGRAPH OF 300 FT. BOAT IN DOCK.

Plates and Material Always on Hand to Repair all kinds of Metal Ships in Shortest Time.



Best Quality of Oak in Stock for Repairing Wooden Vessels of all Classes.

SIZE OF DOCK

Length, Extreme	537 feet.	Entrance, Top,	55 feet 9 in.
Breadth, Top,	90 " 4 in.	Entrance, Bottom	50 "
Breadth, Bottom	52 "	Depth over Sills	18 "

LARGEST DRY DOCK ON THE LAKES.

PRICES FOR REPAIRS AND DOCKING SAME AS AT LOWER LAKE PORTS.

SUPERIOR, WIS.

A NUMBER OF PROPELLER WHEELS IN STOCK AT DRY DOCK.

A. GILMORE'S SONS,

DRY DOCKING SHIP BUILDING AND REPAIRING.

EAST SIDE, NEAR IRONVILLE. - - TOLEDO, O.

Dimensions of Dock, 236 feet long, 55 feet wide at top and 37 feet wide at gate. Nine feet water over sill.

RATES OF DOCKING, Ten Cents per Registered Gross Ton for Vessel over 200 Tons.

Jig Mill and Planer in connection with Dock. PHONE NO. 157.

Paint your Vessels with **Superior Graphite Paint**

NO BLISTERING, CRACKING OR SCALING.

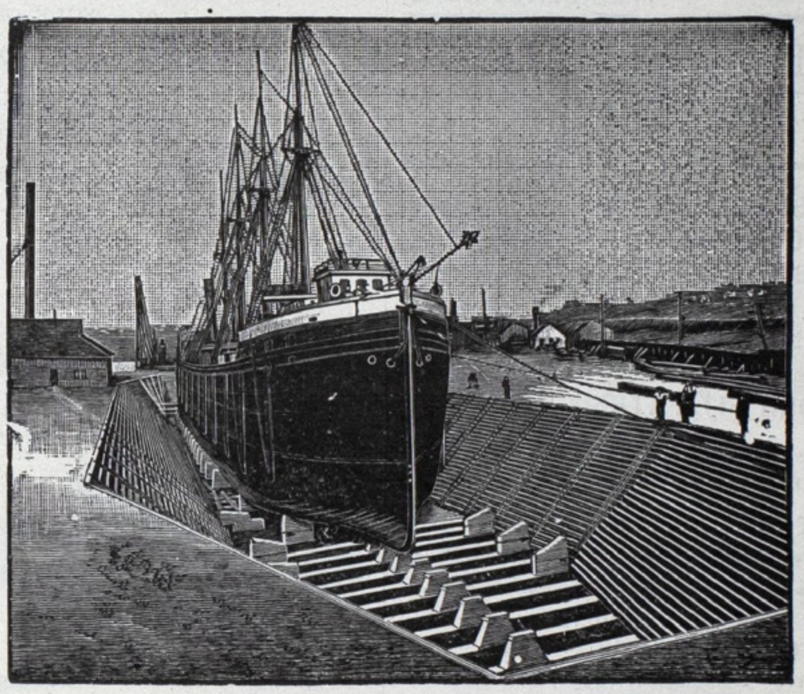
Made especially for Stacks, Decks, Sides, Hulls and Water Compartments. Strictly anti-rust, and most durable and economical.

DETROIT GRAPHITE MFG. CO. 542 River St., Detroit, Mich.

WHITTON & BATES, Agents, 503 Perry-Payne Building, Cleveland, O.

THE SHIP OWNERS DRY DOCK CO.

Largest DOCK YARD on the GREAT LAKES.



Capacity with Two Docks to Dock the Largest Ships on the Lakes.

GENERAL REPAIR WORK PROMPTLY ATTENDED TO.

Being equipped with Lucigen Lights we do work at night as well as day.

TELEPHONE 1635. Foot of Weddell Street, CLEVELAND, O.

ESTABLISHED 1857.

THOMAS MARKS & CO.,

Merchants, Forwarders and Ship Owners.

PORT ARTHUR, CANADA.

N. B.—Special attention given to chartering vessels.

Calvin Carr. G. C. Blair. John Mitchell.

CARR & BLAIR

VESSEL AND INSURANCE AGENTS,

Rooms 1 and 2. Tel. Main 869.

12 Sherman St. CHICAGO.

A. A. Parker. James W. Millen. B. W. Parker.

PARKER & MILLEN,

Vessel & Insurance Agents.

Iron Ore & Coal Cargoes a Specialty.

Rooms 3 & 4 15 Atwater St., West.

DETROIT, MICH.

Capt. J. A. Calbick Wm. H. Wood

Telephone Main 3952.

J. A. Calbick & Co.,

Vessel Agents and Underwriters.

6 Sherman St., CHICAGO.

Capt. J. A. Calbick, Wrecking Master and Surveyor.

J. G. Keith. D. Sullivan.

J. G. KEITH & CO.

VESSEL AND INSURANCE AGENTS,

140 and 141 Rialto Bldg. CHICAGO.

Telephone No. 3658.

JOHN PRINDIVILLE,

VESSEL AND INSURANCE AGENT,

12 Sherman Street,

Telephone Main 129. CHICAGO.

C. A. MACDONALD & CO.,

GENERAL MARINE INSURANCE AGENTS.

RIALTO BUILDING, CHICAGO, ILL.

THOS. WILSON,

MANAGING OWNER WILSON'S TRANSIT LINE,

General Forwarder, Freight and Vessel Agent. CLEVELAND, O.

C. R. JONES & CO., VESSEL AGENTS

FIRE AND MARINE INSURANCE.

Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.

MITCHELL & CO., Vessel and Insurance Agents,

Office Telephone, 767. 508-509-510 Perry-Payne Building,

Residence John Mitchell, 3506. CLEVELAND, O